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CONTENTS

JOHN E. ANDERSON ..... FRONTISPIECE

PSYCHOLOGICAL ASPECTS OF THE NATIONAL ROSTER OF SCIENTIFIC AND SPECIALIZED PERSONNEL ..... LEONARD CARMICHAEL 251

PSYCHOLOGICAL PRACTICE AND RESEARCH IN VOCATIONAL GUIDANCE ..... MORRIS S. VITELES 258

EDUCATIONAL PSYCHOLOGY—INDIVIDUAL OR SOCIAL? ..... WILLIAM CLARK TROW 265

A SIMPLIFIED METHOD FOR SCORING THE STRONG VOCATIONAL INTEREST BLANK ..... DORTHA M. PETERSON AND JACK W. DUNLAP 269

EMPLOYMENT TRENDS IN APPLIED PSYCHOLOGY, II ..... F. H. FINCH AND H. E. GOODFELLOW 275

TYPES OF TOTAL SCORES ON MENTAL TESTS ..... F. KUHLMANN 279

THE DERIVATION OF THREE SUBSCORES FROM THE 1937 REVISION OF THE STANFORD-BINET SCALES ..... FREDERICK B. DAVIS 287

BOOK REVIEWS 292

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MRS. J. P. SYMONDS, 525 West 120th Street, New York, N. Y.

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John E. Anderson

THIS IS ONE OF A SERIES OF PORTRAITS OF PSYCHOLOGISTS WHO HAVE CONTRIBUTED NOTABLY TO PROFESSIONAL PSYCHOLOGY

Volume 5 NOVEMBER-DECEMBER, 1941 Number 6

JOURNAL OF CONSULTING PSYCHOLOGY

PSYCHOLOGICAL ASPECTS OF THE NATIONAL ROSTER OF SCIENTIFIC AND SPECIALIZED PERSONNEL[1]

By LEONARD CARMICHAEL
TUFTS COLLEGE

IN a discussion of the National Roster of Scientific and Specialized Personnel in a psychological journal, two distinct thoughts present themselves: first, a consideration of the Roster as a psychological instrument to determine individual differences in skills; and, second, a study of the special characteristics of professional psychologists as demonstrated in their Roster registrations, especially as these characteristics bear upon the work demanded of psychologists in the present period of emergency. These two views will be discussed briefly below.

The National Roster of Scientific and Specialized Personnel is the name given to the federal government's new list of America's leading specialists. The Roster list has been brought together for a very specific and practical purpose. Last year it was realized that the rapid expansion of specialized endeavor brought about by the rearmament program made it imperative that a central and analytical register of the specialized abilities of Americans be constructed.

It has been the good fortune of the writer to be associated with this work from the first.

Psychologically the Roster may be viewed as a reservoir of data concerning human individual differences in capacity and skill at the higher levels of achievement. The differences listed in the Roster are those upon which an individual may report accurately concerning himself. In developing the Roster every effort was made to avoid demanding facts concerning the personality which would require the self-registrant to make difficult value-judgments regarding the level of his own capacities. Thus, the cleavage lines of personality described by the Roster are such objective dimensions as age, sex, educational level, travel, and the like. In certain instances, such as linguistic skill, it is true, evaluation is called for. In all such cases, however, the question is phrased in so far as possible in a way that will bring about as objective an evaluation as possible. At the present

[1] This article is a continuation of a symposium on "Psychological Service in National Defense," published in the JOURNAL OF CONSULTING PSYCHOLOGY, 1941, 5 (5, September-October). *See* K. M. Dallenbach, The Work of the Emergency Committee in Psychology, p. 211.—EDITOR.

time the staff of the Roster and expert consultants have constructed more than fifty highly specialized technical check lists in such fields as physics, psychology, and economics. These check lists are used to amplify and accompany a general questionnaire. This general questionnaire has been constructed so that it will be just as appropriate to the business executive as to the research physicist.

All told, more than three hundred thousand questionnaires have been mailed to American specialists, and a large proportion of these questionnaires have been returned and are now available in the Roster's punch-card index. The punch-card index is made by appropriately coding or reducing to numerical symbols the qualitative data given on the returned questionnaires. In most instances six 80-column punch cards are allotted to each individual registered on the Roster. Registration of this sort provides an amazingly adequate quantitative and qualitative picture of those aspects of the individual which may be called the "professional personality."

As is true in all studies of individual differences, the Roster makes possible certain generalizations concerning differences which are correlative with other criteria. For example, the median age of registrants on the Roster was found to be 37.4 years. This youthfulness is surprising, especially when we consider that the median age of all the population of America, including all babies and children as well as adult citizens, is 28.9 years. A study of the ages of Roster registrants shows that only .3 per cent is under 20; in the age group 21 to 30, we find 25.2 per cent; 31 to 40, 32.1 per cent; 41 to 50, 22 per cent; 51 to 60, 13.9 per cent; 61 to 70, 5.3 per cent; 71 and over, 1.2 per cent.

Interesting statistical comparisons will also be made, as time allows, of the data filed on the Roster cards concerning differences in age levels in various professional groups. Difference in ratio of the two sexes in different professional groups will also be determined later. It is believed that information of this sort may have important implications for vocational and educational guidance. Already in the use of the Roster some new relationships between supply and demand in the learned professions have become clear.

It is obvious to those concerned in the development of the Roster that the proper placement of university teachers, industrial research men, and, indeed, all other specialists, might be facilitated in normal times as well as in the present emergency period by the use of the National Roster. The Continental nations have long had available information of the sort now contained in the Roster. The British also have a national register which lists their highly trained men. The Roster indeed may be viewed as an applied psychological device for conveniently dealing with certain especially important human individual differences. As such, it may be considered as one more demonstration of the fact that central planning and national efficiency support rather than undermine the democratic way of life.

In the paragraphs given above, a brief summary has been presented of the general aspects of the Roster which may be thought of in relation to the topic "The Psychology of Individual Differences." In the paragraphs given below, some special reference will be made to the relationship between the Roster and psychology as a profession.

A total of 3,762 questionnaires and accompanying check lists in the field of psychology have been mailed to individ-

ual psychologists by the office of the Roster. The names of these psychologists were largely obtained from membership lists of national psychological organizations. Many names, in addition to those obtained from such lists, have been added to the Roster as a result of public announcements of the existence of the Roster. At all times qualified persons are urged to write directly to the office of the National Roster of Scientific and Specialized Personnel in Washington, D.C., and request a Roster blank. Such requests should include in all cases a suggestion of the individual's specialty, as "psychology," "chemical engineering," or "modern languages." The total number of questionnaires in psychology already mailed out includes 396 mailed to men and women who were about to receive master's degrees or doctor's degrees in psychology in June, 1941. It is interesting to note that of this total number of young psychologists, only 155 have so far replied to the Roster questionnaire, whereas, relatively, a much larger number of replies have been received from the older segment of the professional group. At the present time the full data concerning 3,066 psychologists have been coded and placed in the analytical files of the Roster.

It will interest psychologists to know that the advice of a number of professional psychologists was secured in the early stages of the development of the general questionnaire as well as of the technical check list in this field. Above all, special mention should be made of the work done on both of these instruments by Dr. Carl C. Brigham of Princeton University. Dr. Stevenson Smith of the University of Washington also gave many important suggestions concerning the technical check list in psychology. As a matter of record, the breakdown of psychology as given in the technical check list is reprinted below.

TECHNICAL CHECK LIST

Psychology

Please check below those fields (not more than five) in which you have specialized. Transcribe the symbols of the fields which you check to item 19(a) of the questionnaire in accordance with the instructions given there.

Field of Specialization

GENERAL AND EXPERIMENTAL

——Aesthetics	70.0.00
——Apparatus design and construction	70.0.10
——Bibliography and editing	70.0.20
——Feelings and emotions (n.e.c.)	70.0.30
——Perception and attention	70.0.40
——Psychology of sensation	70.0.50
——Religion and ethics	70.0.60
——Theoretical	70.0.70
——Thought processes	70.0.80

LEARNING—Comparative and Motivation

——Animal learning	70.1.00
——Animal motivation	70.1.10
——Animal senses and perception	70.1.20
——Conditioning	70.1.30
——Human motivation	70.1.40
——Instincts, migration, and homing	70.1.50
——Learning experimentation (n.e.c)	70.1.60
——Learning theory	70.1.70
——Memory and forgetting	70.1.80

PHYSIOLOGICAL

——Autonomic nervous system	70.2.00
——Brain localization	70.2.05
——Electroencephalography	70.2.10
——Emotions, physiology of	70.2.15
——Glandular and motor physiology	70.2.20
——Hearing	70.2.25
——Labyrinth and nystagmus	70.2.30
——Neuroanatomy and neurohistology	70.2.35
——Neuropathology	70.2.40
——Physiology of the nervous system	70.2.45
——Respiration and metabolism	70.2.50
——Senses (n.e.c.)	70.2.55
——Sleep and drugs	70.2.60
——Vision	70.2.65

SOCIAL

——Attitudes and their measurement	70.3.00
——Crowd behavior	70.3.10
——Institutions	70.3.20
——Language and communication	70.3.30
——Leadership and politics	70.3.40

——Propaganda and suggestion 70.3.50
——Social behavior of animals 70.3.60

ABNORMAL

——Clinical psychology 70.4.00
——Criminology and delinquency 70.4.10
——Mental defects 70.4.20
——Mental hygiene 70.4.30
——Neuroses and psychoses 70.4.40
——Psychiatry 70.4.50
——Psychoanalysis 70.4.60
——Sex and sex adjustment 70.4.70
——Training the physically handicapped 70.4.80

EDUCATIONAL

——Administration 70.5.00
——Adult education 70.5.10
——Child psychology 70.5.20
——Education, higher 70.5.30
——Education, primary 70.5.40
——Education, secondary 70.5.50
——Recreation 70.5.60
——Reading and speech 70.5.70

PSYCHOMETRICS

——Construction of questionnaires, schedules, etc. 70.6.00
——Interviewing 70.6.10
——Psychophysics 70.6.20
——Public opinion polls 70.6.30
——Statistics, elementary 70.6.40
——Statistics, advanced 70.6.50
——Test construction and standardization 70.6.60

APPLIED

——Advertising 70.7.00
——Auto personnel and selection 70.7.10
——Aviation personnel and selection 70.7.20
——Efficiency and fatigue 70.7.30
——Industrial 70.7.40
——Marketing 70.7.50
——Personnel work 70.7.60
——Safety and accidents 70.7.70
——Vocational guidance 70.7.80

INDIVIDUAL DIFFERENCES

——Constitutional types 70.8.00
——Emotions, measurement of 70.8.10
——Graphology, physiognomy, etc. 70.8.20
——Intelligence, measurement of 70.8.30
——Motor skills, measurement of 70.8.40
——Personality and its measurement 70.8.50
——Race psychology 70.8.60
——Trade testing and occupational selection 70.8.70

OTHER—Describe:—

(This space is to be used only in the event that one or more of your fields of specialization is not adequately provided for above.)

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.....

Note: "n.e.c." denotes "not elsewhere classified."

Please check below the "Function" or occupational status which is most nearly descriptive of your present or most recent work.

Transcribe to item 19(b) of the questionnaire the number representing the function you have checked.

FUNCTION

——Research ..... 0.
——Test administrators and clinicians 1.
——Editors and writers ..... 2.
——Consultants ..... 3.
——Instructors (including laboratory assistants) ..... 4.
——Professors (all grades) ..... 5.
——Administrators ..... 6.
——Field study workers ..... 7.
——Other ..... 8.

In the space below please give a brief description of the duties performed under the function you have checked above.

.....
.....
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.....

.....
(Signature)

Certain professional psychologists have criticized this check list and a number of its subdivisions. It seems especially true that many psychologists would have preferred to have the heading "Abnormal Psychology" presented as a subheading of "Clinical Psychology" rather than as the term was used. Attention should be given, however, to the fact that the headings on any of

the technical check lists are for convenience only, the detailed items alone being coded and used on the punch cards of the analytical index.

Rather to the surprise but certainly to the pleasure of the author of the present article, the field of psychology has been an active one in the demands that have been made upon the Roster by defense agencies of the national government. The largest single request so far for psychologists has come to the Roster from the office of the Selective Service System. This request was for the names of psychologists competent in testing procedures who could be called upon for test administration in local Selective Service centers. Under the direction of Dr. Steuart Henderson Britt of George Washington University, a special consultant called to the Roster to assist in this program, and through the administration of a special committee of the National Research Council, this important request has been most effectively dealt with. As a result of Dr. Britt's endeavors an evaluated list of psychologists competent in the field of individual testing in each state has been forwarded to the appropriate Selective Service office. Besides this large request, there have also been demands for psychologists competent in the following fields, among others: the analysis of propaganda, opinion polls, personality procedures, physiological and psychological optics in a number of its special branches, physiological and psychological acoustics, behavior of human beings at high altitudes, air sickness, and recreation leadership.

It is impossible at the present time to state how many psychologists have been actually placed in full-time paying government positions as a result of the activity of the National Roster, but it is certain that a good many such appointments have been made.

It seems to the writer that the Roster is a tool of great importance in effecting the proper placement of American specialists. In recent years much has been said about placement in the field of psychology. The Roster can do much in this field as soon as the pressure of immediate defense work slackens. For this reason it is hoped that professional psychologists and other scientists will cooperate with the staff of the Roster in urging the maintenance of the work of the Roster in normal times as well as in the present period of emergency.

PSYCHOLOGICAL PRACTICE AND RESEARCH IN VOCATIONAL GUIDANCE[1]

By MORRIS S. VITELES
UNIVERSITY OF PENNSYLVANIA

AN historical review of the application of psychology in vocational guidance shows that we have passed through *one* stage, are in the middle of a *second*, and on the threshold of a *third*.

STAGES IN THE APPLICATION OF PSYCHOLOGY IN VOCATIONAL GUIDANCE

The *first* stage was marked by a *widespread dissemination of all kinds of psychological tests*, which were bought by school people with the same confidence that was displayed by the purchases of indulgences in an earlier era. As a matter of fact, abuses in the use of tests have led, in some quarters, to a revolt against tests which, while perhaps not having the same significance as the protest against indulgences, is still accomplishing an extremely useful social purpose in indicating fundamental lines of development for the application of psychology in vocational guidance.

There is no need to discuss at length the problems involved in the use and abuses of tests in guidance since they have been adequately covered in the literature. However, it is important to note, in passing, that this stage in the application of psychology coincides with the period of the "mass approach" in guidance by the educator — a period which is also happily passing on its way.

The *second* stage in the application of psychological methods is marked by an emphasis on what is essentially the *clinical method in the study of the individual seeking advice*. This involves the recognition, perhaps too long delayed, that no matter how broadly or how narrowly the function of guidance is conceived, it tends to be effective only to the degree that we can synthesize all available data concerning the individual to arrive at a comprehensive understanding of his potentialities and liabilities (2).

We appear now to be in the midst of an era of such individualization in guidance, marked not only by the use of the clinical method in counseling, but also by the ever-increasing use of the cumulative individual inventory as an aid in obtaining facts essential for individual diagnosis. Again it is necessary only to refer to the literature, to pamphlets published by government and state agencies, as well as by individual workers in the field, to discover that this represents a most emphatic trend in the practice of guidance today.

In insisting that the present trend is towards adequate individual diagnosis in guidance, it is not my intention to give the impression that we have completely passed out of the stage of uncri-

[1] An address delivered at the Annual Meeting of the Pennsylvania Association of Clinical Psychologists, Harrisburg, Pa., April 29, 1940.

tical dissemination and use of tests. The history of every science shows tremendous overlapping among successive developmental stages. There are even today physicians who continue to place reliance upon blood letting as an almost universal panacea for illnesses of all kinds, while their more advanced colleagues insist upon the use of more differentiated therapeutic measures. Teachers in the high schools and colleges of the country probably still continue to refer to the atom as the indivisible element of matter, in spite of the fact that the physicist has been able to split this up into still smaller constituents and appears to be continuing with this process of subdivision. Doctors here and there still continue to tell parents of low-grade feeble-minded children that the latter may recover with the onset of adolescence, in spite of the fact that our present-day knowledge of this condition frequently points to the necessity of informing parents early of the incurability of the condition and of advising them to seek institutional placement of the children. So it is also with respect to the use of psychological methods in vocational guidance. The practices of the first stage still persist while we are in the midst of the second stage and entering the threshold of the third.

The third stage in the use of psychological methods in vocational guidance is marked by an attempt to find out what has been accomplished through the use of psychological techniques and what can be accomplished in the future through the improvement and refinement of these tools and procedures of psychology. The third stage, in other words, is essentially one of *intensive research designed to evaluate and improve psychological procedures in vocational guidance.*

AREAS OF RESEARCH IN VOCATIONAL GUIDANCE

This paper is devoted primarily to a brief discussion of this third stage in the application of psychology to guidance. Two or three areas requiring investigation may be used to illustrate the need for more rapid advances along the research front, and of the results which can be obtained through a more intensive exploitation of this approach in the application of psychology to guidance.

THE IMPROVEMENT OF PREDICTORS

The first area of research still requiring intensive exploitation, in spite of past years of work, is that centering around the improvement of psychological tests and allied objective techniques. The question of the reliability and validity of tests is still, in most cases, largely an unsettled one. While using total scores on examinations, including diverse test items, we are still largely neglecting the potential value of subtests in making differential predictions for the varied courses offered by universities and for varied trades. The norms furnished with tests are still, in the main, inadequate with respect to sampling and unsatisfactory with respect to making suitable allowances for local differences. Numerous illustrations of the same kind will occur to anybody who has worked in this field.

Perhaps a striking illustration of the need for research is to be found in connection with the use of the continuous or permanent individual inventory in guidance. The work of Ben Wood and others in promoting such records has been extremely effective in increasing their use as aids in educational and vocational guidance. There are many who believe that such inventories—containing data in the form of health records; the results

of successive applications of psychological and achievement tests; comments by teachers, counselors, etc. — transmitted from elementary to high school, to college, represent the only sound basis for diagnosis in counseling. Such inventories, it is claimed, provide the only valid description of students' abilities, interests and personalities, "since they present the curve and direction of the student's development as contrasted with the snap-shot pictures collected by most counselors" (2) in single or occasional interviews and testing situations.

EFFICIENCY IN THE USE OF PREDICTORS

There is much merit in such claims for the cumulative individual inventory. At the same time, few studies have been devoted to an analysis of such records with a view of determining accurately the significance of individual items; the advantages and disadvantages of repeated examinations; the value of spontaneous as contrasted with formal reports by teachers.

Among the studies which have been made, is one by Keys (5) bearing on the increase of a predictive value of an item for a period of time. It is clear, from the evidence of this study, that a composite of two years' data on educational achievement tests is definitely superior to that of a single year for predicting success. At the same time, the study shows that test results may often be of value after an interval of two or three or more years after the date of testing. This means that schools which are unable to finance extensive testing programs can accomplish substantially as good results by checking achievement every second or third year.

From another study, by Segel (6), involving a comparison among mental tests, achievement tests, average high-school marks, college scholarship, etc., there is clear evidence that while the combination of certain items improves the prediction of college scholarship, the addition of other items will not give information beyond that which can be obtained by the use of a few items. In this case, as has been found in the preparation of psychological test batteries, a multiplication of items, in spite of the extra costs involved in their use, frequently fails to produce returns in the way of improved forecasting efficiency.

The fact that such studies have produced important results merely indicates the need for further investigations of the same kind. As a matter of fact, on purely economic grounds such investigations are needed because it may very well be that, in our ignorance of which items are important, we are expending a great deal of money on keeping costly complete records where less detailed records would be entirely satisfactory. I have in mind, for example, the experience of one industrial firm which found that the work of a clerk, who was paid ninety dollars a month to make a daily check on the telephone company's billings, provided a monthly return of approximately only ten dollars, since the average errors in billings was only in that amount. It may be that the same situation exists with regard to the cost of extremely detailed records maintained in the school system. Under any circumstances, adequate investigation will reveal those items which are significant and thereby improve the forecasting efficiency of the individual inventory while reducing the cost involved in its maintenance.

EVALUATION OF THE GUIDANCE PROGRAM

Even more important than the research on tools and techniques is that which involves an evaluation of a guid-

ance program as such. A review of the literature shows that there are approximately only a dozen studies in which an attempt has been made to find out whether the guidance program works (4). Even these studies are generally marked by a completely unsatisfactory orientation with respect to the ultimate outcome of guidance.

An evaluation of the guidance program involves a definition of individual adjustment or of vocational success. In practically all studies it has been assumed that individual adjustment or success can be measured by considering separately, or in additive fashion, such matters as earnings, job tenure, frequency of change from one job to another, estimated interest, ratings by employers, and so on. Both the experimental and statistical techniques employed assume that these elements combine in an arithmetical fashion to make the success or failure of the individual. The entire situation is really viewed as a more or less simple problem in arithmetic, involving the solution of the formula x plus y plus z, or the results of the component x plus y plus z.

THE NATURE OF VOCATIONAL SUCCESS

At the risk of repeating what is already known perhaps to many members of this group, it seems well to stress again the fact that there is needed not only more evaluation of guidance, but also, as a basis for meaningful research, a reorientation of our attitude with respect to the functional outcomes of the guidance program, particularly with respect to what constitutes vocational adjustment or success. We cannot paint a true picture of the individual's success by adding length of service to wages to job tenure, etc., any more than we can appreciate the true character of the mosaic by counting the number of red, green, gold, white, and other colored bits of stones that go into its making. In both instances the essential feature—the pattern—is lost in the process of analysis. Experience in handling individuals as such, not as cases or numbers on a protocol, shows that vocational success or adjustment is an integrated whole composed of subordinate parts combined in a dynamic functional pattern. We cannot isolate one part or factor from the influence of other parts or factors with which it is in intimate, dynamic association, without changing its character and influencing the pattern from which it has been extracted.

This artificial isolation of factors in vocational success, which has been employed by Thorndike (7) and others in the evaluation of guidance programs, has still another serious fault. This is the implicit assumption that each factor has the same weight in determining success or failure for every one of the individuals in the group studied. For example, when interest in a job is weighted in proportion to the time spent on that job, the underlying belief of course is that the individual who spends a longer time on a job is better satisfied and is more successful, or better adjusted, than one whose job tenure is shorter. Likewise the treatment of wages involves the assumption that there must be a constant relationship between amount of wages and degree of vocational success. Within certain limitations, such assumptions may represent valid generalizations in the treatment of mass data involving isolated single variables. Other things being equal, an increase in wages may reasonably be viewed as an index of improved adjustment and increasing success on the job.

Unfortunately, in actual life, insofar as individual reaction is concerned, other things do not remain equal or constant.

For example, if an individual's wages are in his opinion reasonably high, a small increase may have little or no meaning as an index of success on the job, particularly if a union or other agency has come into the picture to enforce still higher wages in a particular plant. If the individual has no need to be completely self-supporting, an increase may again have little meaning in terms of his success or failure. On the other hand, in a family at the marginal income level, a small increase may have much greater weight in evaluating the success of an individual member than is indicated in the position of the appropriate step interval on a scatter diagram or correlation chart. The situation becomes even more complex when we consider such other items as satisfaction, job tenure, etc. In general, in the complex pattern of family, technological, economic, and broadly social forces which determine the number and variety of job changes, these last frequently have little significance in an orderly and scientific evaluation of individual success and failure at work.

A DYNAMIC CRITERION OF VOCATIONAL SUCCESS

The chief difficulty with the techniques employed in a guidance evaluation is that the problem is oriented as one of static relationships. It is assumed that there is a permanent fixed relationship among the factors entering into occupational success of such a nature that when one undergoes a change, the pattern or lines of influence of the remaining elements remain unchanged in form. A psychological analysis of the situation and findings of recent studies on the nature of personality suggests that the contrary is true. In other words, insofar as vocational success is concerned, a change in one factor generally involves a transformation in the relationships among the remaining elements of success. Translated into practical everyday terms, this means that when an individual receives an increase in wages he may or may not develop a greater feeling of satisfaction with a job. Or better still, a man may be highly pleased with a change in title without any change in wages or in other prerogatives of the job, if he is convinced that the change in title is the first in a series of steps which may lead to advancement in the organization. But the reverse may also be true. Likewise, a boy who has just received an increase in wages in a certain job may leave it for another which pays less but which permits him to wear a white collar instead of a denim shirt, or for one of many other reasons which cannot be listed in detail here.

Such are the defects in the methods which have been traditionally employed in developing criteria for follow-up studies in the evaluation of guidance programs. An analysis of these defects can lead to only one conclusion. We must both change our orientation and elaborate our methods in the experimental study of vocational success. We must supplement the statistical analysis of isolated variables by methods that permit an examination of the dynamic interrelationships among the very many diverse factors making for success or failure in work.

CLINICAL RATINGS OF VOCATIONAL SUCCESS

While awaiting the development of objective methods for the weighting of such dynamic relationships, it is possible to resort to the clinical study of occupational histories by trained observers in the field of vocational adjustment, as a technique for evaluating guidance programs. Following a complete review

of the occupational history of an individual, the observer could record, on a suitable rating scale, a judgment of success or failure on the basis of an analysis of the total situation, that is, of a study of all the facts bearing upon individual success. He might, for example, record a high degree of success for a young man, twenty-eight years of age, who has been employed on the same job for ten years at a wage starting at ten dollars and reaching a maximum of sixteen a week, if the subject has the mental status of a border-line deficient.

At the same time he might record a high degree of failure (low degree of success) for a twenty-eight-year-old college graduate, with a wife and child, paid fifty dollars a week on a job held for five years, involving routine work without responsibility, and with very limited opportunities for advancement, if the latter started with an intellectual aptitude at the level of the best one per cent of college students, held many class offices during his period in college, was elected to Phi Beta Kappa, and was graduated with honors into a job with a presumably progressive organization. In other words, the rating would involve a judgment, by the trained observer, on the individual's vocational success, reflecting the accomplishments and satisfactions achieved in relation to the capacities, temperamental traits, health, education, social and economic advantages and disadvantages, and ambitions with which the individual started his vocational career.

That the judgment involved is complex is apparent from this illustration. It is also apparent that such judgments would be highly subjective in character, and perhaps biased by the viewpoint of the expert observer. Bias and other elements of error could perhaps be decreased by having each occupational history reviewed by three judges and by applying other well-known techniques for improving the reliability and validity of such judgments. However, despite these sources of error, the methods of clinical study of occupational history will, at present, give results with much more real meaning and greater validity than can be procured by limiting research in this field to the application of the statistical viewpoint and statistical techniques which have until now been solely employed in the evaluation of guidance programs. Clinical methods can be expected to give a reasonably clear indication as to whether the guidance of children yields us happier, better adjusted, more productive adults than can be brought up in a society which, like societies in the past, provided no formal guidance program for its young people. The data obtained will yield results in terms of living entities, although they will not have the niceties of statistical tables and neatly arranged coefficient correlations which give a semblance of weight and finality in a field of investigation where unbounded curiosity and much humility are needed (10).

FACTORIAL ANALYSIS IN VOCATIONAL GUIDANCE

There is space to refer to one additional area of research which holds forth much promise for the simplification and improvement of psychological practices in guidance. This involves an application of the techniques of factorial analysis to the problem of individual diagnosis and of matching the individual with the requirements of the job. The vocational guidance program involves primarily the problem of obtaining the best possible fit between individual "personalities" and "appropriate" occupations. For such a huge undertaking, Flanagan

points out, "we must have a comprehensive and at the same time fairly small number of descriptive terms which are objectively defined and which vary from individual to individual in a measurable fashion" (3). The work of Alexander (1) in reducing shop achievement to four factors; that of Thurstone (8) in the isolation of primary abilities; the findings of Thurstone (9) that sixty adjectives descriptive of "personality" traits can be accounted for by postulating only five independent common factors,—all suggest avenues of research which can be profitably followed by psychologists interested in improving their practices in guidance.

SYNCHRONIZING PRACTICE AND RESEARCH

The purpose of this paper has been merely to suggest avenues of research which can be explored with profit—and perhaps also with pleasure—by the psychologist working in the field of guidance. I am conscious of the fact that the chores of the daily task perhaps make such roads inaccessible to many of us, that the opportunity to do research is still in the nature of a privilege which frequently conflicts with the demands of the everyday job. However, the least we can do is to remain aware of the need for advancing the progress of this third stage in guidance. We can at least refrain from following the lead of those—particularly schoolmen — interested in vocational guidance who have only too frequently taken for granted that when they gather information about the individual from the home and the school, and match this information with their knowledge of occupations, they cannot help contributing to the emotional adjustment of the individual. As scientists, we must never be satisfied with our present practices or with merely a "feeling of confidence" concerning their usefulness. We must insist upon finding out, through experiment, how valid they are and in continually improving them. Those who cannot do research can at least have the "research attitude" with respect to what they do.

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EDUCATIONAL PSYCHOLOGY—INDIVIDUAL OR SOCIAL?

By WILLIAM CLARK TROW
UNIVERSITY OF MICHIGAN

EDUCATIONAL psychology has unquestionably provided the *piéce de resistance* for college and university programs of teacher education, its content has shown the capacity for change though sometimes in the wake of modifications in educational theory and practice, and it has been enriched by the products of many research laboratories. In spite of these and other favorable considerations, however, complaints are sometimes heard, the chief of which are those which call into question the functional value of the training it provides. To the extent that such criticisms are well founded, I believe that they can be attributed in large measure to the unnecessary delimitations placed upon the subject matter, and to the sporadic nature of the modifications which have been made, usually without due consideration for the underlying unity which should govern the delineation of the field.

There is probably little disagreement with the view that the present content grew out of general psychology largely under the direction of Thorndike's three-volume opus.[1] More recently, the eclipse of neurology and instincts and the rise of urges, and goal-seeking activity have modified Part I; behaviorism and Gestalt have left their mark on Part II; while the rapid development of tests and measurements have revolutionized Part III. But these changes have come largely via psychology, and a very individual psychology at that. They reflect what Gardner Murphy has referred to as the "consistent unconcern which psychologists have manifested toward social behavior."[2]

The narrowness of the program with which most educational psychologists have long been more or less content has been offset by pressure from other directions. So-called progressive educators, curriculum committees, representatives of character-building agencies, innovators in physical education, and youth leaders, in their several languages, have emphasized the implications of the fact that the child develops in a social medium, and that the groups of which he is a member and those with which he comes in contact are matters of importance about which a teacher should be informed.

The trend in educational theory is indicated in careful detail by Anderson.[3] "The child," he writes, "is a social being moving through the types of social experience the school furnishes to the larger social experiences of adult life. As a result we emphasize the importance of the school as a builder of ideals

[1] E. L. Thorndike, *Educational Psychology*, New York: Bureau of Publications, Teachers College, Columbia University, 1913.

[2] Gardner Murphy and Lois Barklay Murphy. *Experimental Social Psychology*, p. 3. New York: Harper & Brothers, 1931.

[3] John E. Anderson. Changing Emphases in Early Childhood Education. *School and Society*, January 7, 1939, 49: 1-9.

and a developer of attitudes and. . . of social effectiveness . . . with specific training in home, school, and community relations." Since a child in school is no Robinson Crusoe, it would seem to follow that the teacher should have a social point of view, and should know about the nature and influence of the home, the church, and other institutions, about community organization, about poverty and delinquency, and the like. As to how and where the necessary knowledge and experience should be acquired there may be differences of opinion. Sociology has been thought by some to be the answer —or, perhaps educational sociology.

While it is readily admitted that a knowledge of social institutions including educational groupings should be a part of the equipment of every teacher, and especially of every administrator, there still remains an important area which, in the opinion of the writer, should be included within the domain of educational psychology. The view I wish to present is that *educational psychology is* not only *individual* but also *social psychology, applied to education.* Such a view keeps the subject within the field of psychology but enlarges it legitimately in the directions in which it has been tending to expand.

A prime difficulty that arises, if this view is accepted, lies in the uncertain boundaries of the field of social psychology itself. It is one of those interdepartmental areas which take shape through necessity in spite of the frowns of the cataloguers. But still it may be defined verbally with sufficient clarity to indicate a program of procedure not only for curriculum construction but also for research. *Social psychology* is basically *the study of the individual in his relationship to other individuals.* The emphasis is moved away from a psychology that is almost exclusively preoccupied with the solitary behavior of a subject responding to a simple sensory stimulus, and toward a consideration of behavior in response to social factors.

For the sociologist the point of emphasis is moved still further, for he is primarily concerned with a study of the social factors themselves, with such units, for example, as the family, the city, and the rural community, that is, with *groups.* It should be added that a correct socio-psychological view not only includes the psychological aspects of sociology narrowly conceived but also of other social sciences—economic, political, regional, linguistic, and so forth—as well as their earlier developmental aspects in anthropology and history.

If educational psychology is viewed as applied social psychology, a further difficulty presents itself, growing out of the nature of social psychology as it has developed in this country. Most social psychologists are classified as sociologists, or they are classified as psychologists. The dichotomy is basically a methodological one, perpetuated by the training social scientists receive for their attack on what are fundamentally the same problems. It may be clarified by reference to the recent literature. Britt[4] has noted that this dichotomy is to be found (1) in the division of the membership of social psychologists between the American Psychological Association and the American Sociological Society, (2) in divided sessions of the two groups on problems of social psychology, and (3) in their divergent reading and research habits. He proposes as a solution a Society of Social Psychologists. Reuter, writing in a somewhat cynical vein, considers that "the differences....

[4] Steuart Henderson Britt. Social Psychologists or Psychological Sociologists — Which? *Journal of Abnormal and Social Psychology,* 1937, 32, (3 and 4, October and December): 314-18.

between the two present-day schools of social psychology [biological-psychological on the one hand and sociological social on the other] are fundamental and apparently irreconcilable." Janus,[6] however, takes a more optimistic view, holding that "material monism and cultural determinism are not quite as antagonistic as some would imply .... and that in either case, it is a fallacy to hold either stimulus-response categories or distinctly social categories as sufficient by and of themselves for an elucidation of social phenomena."[5]

But whatever the outcome, no one will deny that education takes place in a social medium. The child, whose behavior is of concern to the educator, is placed in one more or less controlled social situation after another. His education is distinctly a socio-psychological process. The teacher must be aware of the nature of this process, not only as it operates in the acquisition of the visual and oral subject matter of the school curriculum, though this is important, but also as it operates in the social development of the child. The teacher is in a real sense a social case worker, often wisely, sometimes stumblingly employing clinical techniques for individual and group therapy. The fact that most of his "cases" are normal children does not alter the fact. The task of institutional or clinical re-education is not a whit more important or more exacting than that of the education of maturing boys and girls in complicated processes of social interaction.

If, within the proper boundaries of educational psychology, behavior in such social relationships as the following be included, the usefulness of instruction in educational psychology will be materially enhanced, providing, as it will, what may be called a clinical view of the developmental processes; and, in addition, research work on problems now neglected will undoubtedly be stimulated that these processes, and the techniques for controlling them, may be better understood:

1. *Person-to-Person Relationships*

a. *Teacher-pupil.*—Such dramatic relationships as crushes, hatreds, and fears have received some consideration, and they deserve more. The knowledge of many conditions such as those of embarrassing pupils before a class, gushing, scolding, threatening, encouraging, rewarding, and the like, is in a very primitive stage of development. Kinds of and occasions for suggestion, direction, and command have been lumped together, as have discourses on attitudes, both of teachers and pupils. Techniques of interviewing, counseling, and case work are further advanced in other institutions than they are in the schools.

b. *Pupil-pupil.*—Here only a beginning has been made in studies of cooperation and competition, and in those using the sociometric technique. Pupil crushes, friendships, rivalries, prejudices, and aggressive behavior are usually dealt with in large, easy, psychoanalytic generalizations.

2. *Person-to-Group*

a. *Teacher-class.*—Several items included in the teacher-pupil relationship apply here, such as suggestion, direction, command, prestige, and the like. Little is known about social control in the classroom except for armchair discussions of "discipline," and for Lewin's work on democracy and autocracy; and teachers know less, in spite of the importance of the question for administration and for the experience provided as training for living in a democratic social order. Such practical problems as have been investigated to some extent are likewise properly included as, for ex-

[5] E. B. Reuter. The Status of Social Psychology. *American Journal of Social Psychology*, November, 1940, 46: 293-304.

[6] S. Q. Janus. On the Data of Social Psychology. *Journal of Social Psychology*, November, 1940, 12: 387-92.

ample, the use to be made of marks, intelligence test scores, and ratings.

b. *Pupil-school.*—Far too little is known as to the influence of subgroups upon different individuals, such groups, for example, as classes, grades, homerooms, homogeneous groupings, subject matter and recreational clubs, cliques, teams gangs, and secret societies. There has been little more than speculation about leadership, and status, about popularity, acceptance, exclusion and rejection, about loyalty and the we-feeling, and about ethical interrelationships such as honesty and altruism. (In addition such familiar topics in social psychology as are usually classified under the head of collective behavior should be listed, e.g., imitation, custom, fashion, and opinion.)

c. *Pupil-home* (including community).—The knowledge that teachers have of those relationships of home and community living that are so important for child development comes from their own pleasant, or bitter, experiences, occasionally from a program of home visitation, and sometimes from ecological studies of homes, neighborhoods, and particularly of blighted areas.

3. *Person-to-Symbol*

The study of pupil responses to the cultural heritage of words, numbers, and other symbols are the only ones that have received and are receiving anything like adequate attention from educational psychologists.

The teacher is expected somehow to be master of all of these multifarious relationships to say nothing of the teacher-teacher and teacher-community patterns. It is probably safe to say that educational psychology viewed as applied social psychology would not include within its borders a number of topics or problems of concern to social psychologists generally, for example, with reference to such groups as trade unions, civic bodies, industrial organizations, and so forth, but it would compensate for this exclusion by virtue of the fact that it is *educational.*

What, then, does the applied or technological aspect add to social psychology to make it educational? In my opinion it adds the requirement of controlled or *regulated maturation.* Educational psychology is developmental, essentially concerned with space-time patterns. Whenever the course of development of an individual takes place over a period of time in an environment controlled for the purpose of directing that development, the educational factor appears. The changes in the individual's responses are called learning — though obviously much so-called incidental learning occurs in relation to environments not specifically set up for effecting any definite change. The directing of development implies a point toward which, or goals in the direction of which, the learner is expected to move. The goals are known as educational objectives and in their more general form as values, and are determined in one way or another by the culture in which the process is being carried on.

Thus educational psychology is not a pure but a normative science and in this respect differs from social psychology. It is an applied science and as such is primarily concerned with the problems of the effectiveness of means toward the attainment of socially determined ends. As William Fielding Ogburn[7] has argued, the spreading of knowledge, affecting the beliefs of others, or interpreting life and events for their benefit does not make him a scientist. But the study of such processes scientifically would make him a social psychologist, while the investigation of their effectiveness in an institutional habitat would make him an educational psychologist.

[7] The Folkways of a Scientific Sociology. *Scientific Monthly,* 1931, 30: 300-306. *Also* Statistics and Art. *Journal of the American Statistical Association,* 1932, 27: 1-8.

It seems fair to assume that if educational psychologists should stake out a claim to the field of individual *and* social psychology applied to education, there would be reason for the inclusions and exclusions in the subject matter of their specialization. Educational psychology would have a better chance to "function" because it would include the study of behavior in response to various environmental patterns. As a consequence, the development of individuals — teachers as well as pupils —could be influenced through education in the direction of the objectives and values of our common culture.

A SIMPLIFIED METHOD FOR SCORING THE STRONG VOCATIONAL INTEREST BLANK

BY BERTHA M. PETERSON AND JACK W. DUNLAP
UNIVERSITY OF ROCHESTER

AN instrument that has been found to be of considerable value to guidance and vocational counselors is the Strong Vocational Interest Blank for Men. The scoring of the test, however, is laborious and costly, so much so that it has prohibited the extensive use of the blank. This is unfortunate since there is considerable evidence that the test is valid and deserving of wider application. The present report deals with the results of an attempt to simplify the scoring of this blank.

The Strong Vocational Interest Blank consists of four hundred items to which the individual indicates his reaction in one of three categories. These categories receive weights varying from +4 to −4, according to the occupational pattern for which the blank is being scored. Thus in effect, if the blank is scored by hand, there are, for each occupation, four hundred responses to be weighted and then four hundred values to be added to determine the score for that occupation. This labor can be reduced by the use of the International Business Machines' Test Scoring Machine but still is considerable, since each student's answer sheet must be run through the machine four times for each occupation.

If the range of the weights for the items were reduced from plus and minus four to plus and minus one, then it would be possible to score the answer sheets by running them through the machine only twice per occupation. This would save half of the time in operating the machine and two-thirds of the time in adding the scores for the items. In this study all weights of +2, +3, and +4 were reduced to +1, and similarly the negative values were reduced to −1, while weights of +1, 0, and −1 were left unchanged. This reduction seemed justified in view of the well-known fact that the correlation between weighted and unweighted subtests tends to be high.[1] Further unpublished data of the writers also demonstrate the feasibility of such a procedure. Throughout

[1] S. S. Wilks. Weighting Systems for Linear Functions of Correlated Variables When There is No Dependent Variable. *Psychometrika*, 1938, 3 (1, March): 23-40.

this report whenever scores are referred to as "simplified," they have been obtained using the keys constructed by the above method, while "original scores" refer to scores obtained using Strong's weights.

The total number of individuals employed in the study was 1266, of which 404 were employees of the International Business Machines, 352 were students at the University of Minnesota, and 510 were students at the College of Arts and Science of the University of Rochester. Each of these groups was divided into an experimental group and a control group. Of the two groups from I.B.M., one consisted of 254 salesmen and the other of 150 service men. The groups from Minnesota contained 234 and 118 individuals, and the Rochester groups, 384 and 126 subjects, respectively. Unlike the I.B.M. group of subjects, the experimental and control groups from the two universities were drawn from the same population; however, there was some evidence that the two university populations were not comparable.

Essentially, the procedure involved was to administer the blank to all individuals and to score the tests by means of Strong's weights, that is, to determine the "original scores." The tests were also scored by means of the simplified weights for each of the occupational areas. In a study of this nature the results should be checked by independent samples; if these are in agreement, the data can then be thrown into a single total experimental group. Thus, the next step was to determine, for each of the three experimental groups, the correlations between the original and simplified scores for each occupation.

Regression equations were then constructed for each experimental group for predicting original scores from a knowledge of the simplified scores. These equations were applied to the simplified scores of the corresponding control groups. Next the correlations were determined between these scores predicted by the regression equations and the original scores, together with the percentage of scores that were misplaced by the simplified scoring method. Examination of all the evidence justified combining the three experimental groups into a single group and the three control groups into another group.

Examination of Table I shows that the correlations between the original and simplified scores for the different occupations ranged from .956 to .987 in the I.B.M. experimental group, from .948 to .974 for the Minnesota group, and from .963 to .985 for the Rochester group. When the groups were combined, the correlations varied from .957 to .988. The coefficients and constants for the various regression equations are also given in Table I. An examination of the regression coefficients indicates that for any given occupation the slope of the line is, for all practical purposes, identical for the three experimental groups. The standard errors of the regression weights are given just below the coefficients. In 18 out of 30 cases the differences between the various pairs of regression coefficients for a given occupation were not significant. The last three columns of Table I indicate the cases where the differences were significant.

The constants, however, differ widely from one group to the other in certain of the occupations. This variation is due in part to the fact that the groups are not comparable, one being a group of specialty salesmen, one of students from a general college, and one group from a preprofessional college with a heavy emphasis on science. Thus,

TABLE I

THE CORRELATIONS BETWEEN THE ORIGINAL AND SIMPLIFIED SCORES, TOGETHER WITH THE CONSTANTS FOR THE REGRESSION EQUATIONS FOR THE SEPARATE EXPERIMENTAL GROUPS AND FOR THE COMBINED GROUP (DATA FROM EXPERIMENTAL GROUPS: I.B.M. $N = 254$; MINN. $N = 234$; ROCH. $N = 384$; TOTAL $N = 872$)

Occupational Group	Correlations Original vs. Simplified				Regression Coefficients (b)				k–values for Regression Equations				Prs. of b–s with Signif. Diffs.		
	IBM	Minn.	Roch.	Total	IBM	Minn.	Roch.	Total	IBM	Minn.	Roch.	Total	IBM vs. Minn.	Minn. vs. Roch.	Roch. vs. IBM
Chemist	.956	.953	.969	.960	1.61 ±.03	1.66 ±.03	1.58 ±.02	1.58 ±.02	7.13	−16.48	8.19	3.15		X	
Engineer	.958	.948	.973	.957	1.45 ±.02	1.56 ±.03	1.45 ±.02	1.48 ±.02	12.40	−5.74	15.12	8.75		X	
Life Insurance Salesman	.987	.967	.979	.985	1.27 ±.01	1.39 ±.02	1.33 ±.01	1.40 ±.01	20.00	−10.34	1.13	2.75	X		X
Math-Science Teacher	.968	.973	.975	.971	1.39 ±.02	1.51 ±.02	1.38 ±.02	1.41 ±.01	−12.24	−24.58	−2.57	−10.73	X	X	
Personnel Manager	.962	.972	.973	.973	1.23 ±.02	1.28 ±.02	1.23 ±.01	1.25 ±.01	3.81	3.48	−0.14	1.77			
Physician	.959	.974	.972	.965	1.36 ±.03	1.51 ±.02	1.39 ±.02	1.42 ±.01	−0.63	−13.36	8.49	0.69	X	X	
Psychologist	.966	.963	.963	.971	1.70 ±.03	1.74 ±.03	1.66 ±.02	1.70 ±.01	−5.28	−16.80	−2.94	−0.76			
Purchasing Agent	.965	.962	.969	.970	1.06 ±.02	1.29 ±.02	1.16 ±.01	1.19 ±.01	4.25	−1.22	−3.15	−1.47	X	X	X
Social-Science Teacher	.963		.969	.967*	1.46 ±.03		1.44 ±.02	1.45 ±.02	−15.75		−11.45	−13.21			
Group I	.984		.984	.988*	1.28 ±.01		1.32 ±.01	1.37 ±.01	−0.70		10.26	7.75			
Group V	.969		.979	.976*	1.28 ±.02		1.24 ±.01	1.25 ±.01	−2.51		−2.95	−2.74			
Group VIII	.975		.976	.980*	1.19 ±.02		1.23 ±.01	1.21 ±.01	−1.03		−1.46	−1.45			
Group IX	.979		.978	.980*	1.07 ±.01		1.17 ±.01	1.23 ±.01	12.24		−5.37	−0.95			X
Group X	.983		.985	.984*	1.27 ±.01		1.25 ±.01	1.26 ±.01	13.21		15.30	14.48			

* N = 638 cases

though the slopes of the lines are very similar, the lines are shifted up and down the ordinal axis, as indicated by the values for *k*.

The results of the application of these equations to the control groups for predicting original scores from simplified scores are expressed as shown in Tables II, III, and IV. The correlations in Table II between the predicted and the actual or original scores for each of the control groups varied from .854 to .953 for the I.B.M. data, from .920 to .971 for the Minnesota data, and from .937 to .981 for the Rochester data. The correlations for the total control group varied from .913 to .972. It will be noted that these correlations closely approach the magnitude of the correlations for the experimental groups in Table I.

TABLE II

CORRELATIONS BETWEEN PREDICTED SCORES AND ORIGINAL SCORES FOR THE CONTROL GROUPS

Occupational Group	I.B.M	Minn.	Roch.	Combined
Chemist	.918	.926	.957	.913
Engineer	.940	.920	.966	.944
Life Insurance Salesman	.922	.962	.966	.960
Math-Science Teacher	.948	.971	.937	.953
Personnel Manager	.942	.955	.949	.952
Physician	.944	.948	.972	.949
Psychologist	.854	.924	.964	.941
Purchasing Agent	.936	.947	.952	.947
Social-Science Teacher	.912		.957	.944*
Group I	.939		.981	.972*
Group V	.951		.963	.955*
Group VIII	.946		.968	.957*
Group IX	.927		.964	.955*
Group X	.953		.958	.969*
N	150	118	126	394

* $N = 276$

The total number of scores for the I.B.M. control group is 2100, that is, 150 individuals times 14 occupations. Of these, the predicted scores differed from the actual scores by half a letter grade, for example, from C to C+, in 639 or 30 per cent of the cases, and by a whole letter grade in only 28 or one per cent of the cases, as shown in Table III. In the 944 scores for the Minnesota control group, the estimated grade differed from the actual grade by half a step in 255 or 27 per cent of the cases and by a whole step in just 13 or one per cent of the cases. Likewise in the Rochester group of 1764 scores, 410 or 23 per cent of the scores shifted half a step and only 10 scores or .5 per cent shifted a whole grade.

These shifts, however, are for the most part not significant. It is of no importance if one method rates an individual C and the other C+, or one rates him A and the other B+. Counselors rarely attach much weight to scores less than B+; thus, the critical scores are those that shift between B and B+. Of particular importance are those cases where the individual has an original score of B+, but according to the simplified scoring, would be rated only B. If no favorable advice is given on a B-rating, the individual's attention is not

called to the field. If, however, the true score is B and the simplified score is B+, then slightly more emphasis is given to the occupation than is its due. This is not so serious as the failure of the counselor to mention the occupation. An examination of all the correlation plots revealed that this type of error, that is, over-prediction, occurred one-half as frequently as the error of under-prediction.

Thus, the changes that are of peculiar interest to advisers in terms of validity of advice are those where the individual is rated B by means of the simplified scoring but B+ by means of the original scoring. Table IV shows the per cent of individuals by occupation for each of the groups whose scores were altered in this manner. The proportion of such shifts is, on the average, 3 per cent. Thus, when the simplified scoring system is used advice will be in error only once in 33 times. If it is important that the possibility of this error be eliminated, one could rescore by the original method all papers rated B by the simplified procedure. The last column of Table IV gives the percentage of papers by occupation, based on the data from the combined control groups, that received a B-rating on the simplified method and would have to be rescored if it seemed necessary to eliminate these few errors. In general, approximately 15 per cent of the papers would fall in this category.

In conclusion, the use of the simplified scoring technique was substantiated by the high correlations between the original and simplified scores. Further justification was found in the close correspondence between the predicted and original scores for the control groups. In view of the close agreement between the ratings obtained by the two methods and the marked saving in time when the simplified procedure is used,

TABLE III

ANALYSIS OF THE DIFFERENCES IN LETTER RATINGS OF OCCUPATIONAL INTEREST WHEN SCORED BY THE SIMPLIFIED AND ORIGINAL METHODS

Occupational Group	Number of Changes of One-half Letter Grade, e.g., B to B— or C to C+				Number of Changes of One Letter Grade, e.g., C to B or B+ to B—				Number of Cases with No Changes			
	I.B.M	Minn.	Roch.	Combined	I.B.M	Minn.	Roch.	Combined	I.B.M	Minn.	Roch.	Combined
Chemist	57	32	28	128	8	6	4	29	85	80	94	237
Engineer	50	42	25	123	5	4	1	16	95	72	100	255
Life Insurance Salesman	50	34	32	107	3	0	0	0	97	84	94	287
Math-Science Teacher	38	28	40	111	0	0	2	2	112	90	84	281
Personnel Manager	47	32	45	116	1	0	1	2	102	86	80	276
Physician	55	34	24	114	1	1	0	1	94	83	102	279
Psychologist	19	15	24	66	2	2	0	3	129	101	102	325
Purchasing Agent	41	38	46	118	0	0	0	2	109	80	80	274
Social-Science Teacher	55		28	87	4		2	6	91		96	183
Group I	51		1	45	0		0	0	99		108	231
Group V	37		23	65	0		0	0	113		103	211
Group VIII	37		30	70	0		0	0	113		96	206
Group IX	82		27	72	4		0	0	64		99	204
Group X	20		20	43	0		0	0	130		106	233
Per Cent of Errors in Prediction	30.4	27.0	23.2	26.3	1.3	1.3	0.6	1.2	68.2	71.6	76.2	72.4

the writers recommend the use of the simplified scoring technique.

For preprofessional schools such as the college of Arts and Science of the University of Rochester, it might be wiser to use translating tables based on the regression equations of the Rochester data,[2] and for general state universities, tables based on the Minnesota data. Institutions using the test very extensively may wish to develop equations based on data from the specific institution and from these to build tables for translating simplified scores into letter grades. In general, the writers believe that tables based on the combined groups reported here will be adequate for all practical purposes.

TABLE IV

THE PER CENT OF INDIVIDUALS RATED B BY THE SIMPLIFIED METHOD BUT B+ BY THE ORIGINAL METHOD, TOGETHER WITH THE PER CENT OF INDIVIDUALS WHO RECEIVED A B-RATING ON THE SIMPLIFIED METHOD (DATA FROM CONTROL GROUPS)

Occupational Group	Per Cent Changes Original B+ to Simplified B				Per Cent of B-Scores, Combined Group, Simplified Method
	I.B.M.	Minn.	Roch.	Combined	
Chemist	7	8	2	5	14
Engineer	5	3	1	4	8
Life Insurance Salesman	1	8	2	2	13
Math-Science Teacher	7	3	6	7	18
Personnel Manager	3	2	5	3	18
Physician	2	1	2	2	10
Psychologist	1	4	2	0	5
Purchasing Agent	3	3	10	6	18
Social-Science Teacher	3		2	3	12
Group I	9		2	4	15
Group V	3		7	6	23
Group VIII	4		2	3	14
Group IX	0		5	4	18
Group X	0		3	1	18
Median	3	3	2	3.5	15

[2] Tables for translating simplified scores to letter grades, as well as simplified scoring keys, may be obtained from the Bureau of Educational Statistics, University of Rochester, Rochester, New York.

EMPLOYMENT TRENDS IN APPLIED PSYCHOLOGY, II

By F. H. FINCH
UNIVERSITY OF ILLINOIS
AND
M. E. ODOROFF
MINNESOTA STATE DEPARTMENT OF EDUCATION

TWO years ago the writers made a study of the employment of members of the American Psychological Association over the twenty-two-year period from 1916 to 1938.[1] This paper brings that material up to date by using data available in the 1940 directory of the American Psychological Association.

All persons listed in the 1940 directory were classified as to the type of work in which they were engaged, insofar as it was possible to do this from the information included in the directory. The directory for this year lists the names of 2,739 persons. These may be divided into three main groups: (1) persons teaching psychology and related subjects on a full-time or part-time basis, 1,373; (2) persons apparently employed full time in psychological work other than teaching, 888; and (3) persons apparently not employed full time in psychological work, such as persons listing no employment, students, including graduate assistants and psychological interns, persons who have retired, and persons engaged in work not ordinarily requiring professional training in psychology, 478. From this it appears that 2,261 members of the American Psychological Association are employed as psychologists. Table I shows that since 1931 the employed membership has increased from 1,065, a gain of 112 per cent. Increase in the teaching category during this period has been 76 per

TABLE I

EMPLOYMENT OF MEMBERS OF AMERICAN PSYCHOLOGICAL ASSOCIATION

	1931	1938	1940	Per Cent Increase Since 1931	Per Cent Increase Since 1938
No. of A.P.A. members	1,267	2,318	2.739	116	18
Members employed in psychological work	1,065	1,923	2,261	112	18
Teaching	779	1,229	1,373	76	12
Psychological jobs other than teaching	286	694	888	210	28
Per cent in non-teaching jobs	26.9	36.1	39.3	—	—

[1] A summary of the findings appeared in the JOURNAL OF CONSULTING PSYCHOLOGY, 1939, 3 (July-August): 118-122.

TABLE II

CLASSIFICATION OF JOBS IN APPLIED PSYCHOLOGY

		1931	1938	1940	Per Cent Increase Since 1931	Per Cent Increase Since 1938
I	Clinical	95	231	272	186	18
II	School	34	113	146	324	29
III	Guidance and Personnel (Not inc. industrial)	18	88	153	750	74
IV	Industrial	24	61	58	142	—5
V	Consulting	31	60	83	168	38
VI	Research	78	132	164	110	24
VII	Publishing	6	9	12	—	—

cent; psychological positions other than teaching have at the same time increased from 286 to 888, or 210 per cent. Increases during the last two years have maintained in general the trend characteristic of the entire period. The proportion of the American Psychological Association membership engaged in teaching has declined slowly but steadily throughout the years. Employment in other types of psychological work, which we may term "applied psychology," has increased until it now includes over 39 per cent of the total membership employed as psychologists.

For present purposes attention may be given to the work of the 888 members who are employed as applied psychologists. Table II shows the results of grouping their jobs in seven categories. The groupings were made by considering job titles listed, information concerning the work done, and whatever could be discovered regarding the employing agency. The data available in the directory are of such a nature that this grouping is somewhat crude and while there are other limitations that will be mentioned later, this table shows certain unmistakable trends which have been going on with respect to the employment of those applied psychologists who are represented in the membership of the American Psychological Association.

The largest of the seven groups is the one that has been designated "Clinical." This included psychologists working in various types of clinics, in courts and penal or correctional institutions, in hospitals, in schools for defective children, and any member employed by a social agency who listed his work as clinical psychology.

A second group, which can be differentiated from the first on the basis of source of employment, but which is composed of persons whose duties are in large measure similar to those of persons representing the "Clinical" group, has been designated "School Psychologists." The majority of these are employed by public boards of education. There are several working in private elementary and secondary schools and a few who are employed in state departments of education.

The third group, made up of persons whose duties resemble in some degree those of psychologists in the two groups previously mentioned, has been designated, on the basis of job titles and the

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CONTENTS OF VOLUME V

ARTICLES

ALLPORT, G. W. Psychological Service for Civilian Morale 235

BAXTER, B. AND PATERSON, D. A New Ratio for Clinical Counselors 123

BENNETT, G. The Museum Technique Applied to Market Research 183

BINGHAM, W. V. Psychological Services in the United States Army 221

BRITT, STEUART HENDERSON. The Listing of Personnel in Psychology 243

BRITT, STEUART HENDERSON. Pending Developments in the Legal Status of Psychologists 52

BRITT, STEUART HENDERSON. Résumé of Washington Round Table on Certification of Psychologists 74

BROTEMARKLE, R. A. Training Needed by Psychologists for Government Service 245

BRYAN, A. I. AND WILKE, W. H. A Technique for Rating Public Speeches 80

BURTT, H. E. Current Trends in Marketing Research 145

CARMICHAEL, L. Psychological Aspects of the National Roster of Scientific and Specialized Personnel 253

CORNELL, E. Certification of Specialized Groups 62

DALLENBACH, K. M. The Work of the Emergency Committee in Psychology 210

DAVIS, F. B. The Derivation of Three Subscores from the 1937 Revision of the Stanford-Binet Scales 287

DUNLAP, J. W. AND PETERSON, B. M. A Simplified Method of Scoring the Strong Vocational Interest Blank 269

ENGLISH, H. B. Fundamentals and Fundamentalism in the Training of Applied Psychologists 1

FINCH, F. H. AND ODOROFF, M. E. Employment Trends in Applied Psychology, II 275

FRYER, D. Introduction: Contribution of Certification to Unified Professional Status 49

GATES, A. I. New Fields for Educational Psychologists 111

JENKINS, J. G. Characteristics of the Question as Determinants of Dependability 164

JENKINS, J. G. Selection and Training of Aircraft Pilots 228

KORNHAUSER, A. W. The Role of Psychological Interpretation 187

KUHLMANN, F. Retrogressive Trends in Clinical Psychology 97

KUHLMANN, F. Types of Total Scores on Mental Tests 279

LANDIS, C. Certification by States or by Organizations 56

LAZARSFELD, P. F. Evaluating the Effectiveness of Advertising by Direct Interviews 170
LOUTTIT, C. M. Psychological Work in the United States Navy 225
LUCKEY, B. M. Résumé of Pennsylvania Round Table on Licensing of Psychologists 78
MILES, W. R. Coordination of Psychological Services in the National Emergency 216
ODOROFF, M. E. AND FINCH, F. H. Employment Trends in Applied Psychology, II 275
O'ROURKE, L. J. Standards for Psychologists in Civil Service 59
PATERSON, D. G. and BAXTER, B. A New Ratio for Clinical Counselors 123
PETERSON, B. M. AND DUNLAP, J. W. A Simplified Method for Scoring the Strong Vocational Interest Blank 269
RUCH, F. D. Effects of Repeated Interviewing on the Respondent's Answers 179
SAFFIR, M. A. Issues in the Enactment of Legislation 70
SELLING, L. S. Training as a Basis of Certification 66
STANTON, F. Problems of Sampling in Market Research 154
SUPER, D. E. A Comparison of the Diagnoses of a Graphologist with the Results of Psychological Tests 127
TROW, W. C. Educational Psychology—Individual or Social? 265
VITELES, M. S. Caveat Emptor 117
VITELES, M. S. Psychological Practice and Research in Vocational Guidance 258
WEAVER, H. G. Proving Ground on Public Opinion 149
WELLS, F. L. Some Functions of Mental Measurement in the Young Superior Adult 105
WILKE, W. H. AND BRYAN, A. I. A Technique for Rating Public Speeches.... 80
WOLFLE, D. Psychologists' Activities in the National Emergency 240
YERKES, R. M. Man-Power and Military Effectiveness: The Case for Human Engineering..... 205

BOOK REVIEWS

Bell's Matching Youth and Jobs: M. R. TRABUE 292
Brown's The Psychodynamics of Abnormal Behavior: D. SHAKOW 140
Erdélyi's Dictionary of Terms and Expressions of Industrial Psychology: B. V. MOORE 91
Gesell, Amatruda, Castner and Thompson's Biographies of Child Development: E. E. LORD 90
Lewin, Lippitt, and Escalona's Studies in Topological and Vector Psychology I.: W. REICHENBERG 294
Maslow and Mittelmann's Principles of Abnormal Psychology: L. F. SHAFFER 251
Reynolds' Children from Seed to Saplings: F. M. TEAGARDEN 141

Williamson and Hahn's Introduction to High School Counseling: A. C. EURICH 293
Young's Personality and Problems of Adjustment: W. W. BIDDLE 292

MISCELLANEOUS

Biography of E. A. Doll 47
Forum Discussions 95, 143, 252
News Notes 44, 92, 138, 190, 249
Official Reports 14, 42, 134
Portraits: J. E. ANDERSON ..... facing 253
H. E. BURTT ..... facing 145
Committee on Psychological Examination of Recruits, 1917 ..... facing 1
A. S. OTIS ..... facing 205
C. SPEARMAN ..... facing 97
M. S. VITELES ..... facing 49
Program of the Fifth Annual Conference of the American Association for Applied Psychology, Inc., Northwestern University 197
Publications Received 142

agencies in which the work is done, as "Guidance and Personnel Workers." It includes educational and vocational counselors in public and private schools, colleges, and other educational organizations, in social agencies, in independent guidance and counseling agencies, in the public employment service, and other personnel workers employed in government service. The increase here, amounting to 750 per cent in nine years, and to 74 per cent since year before last, surpasses the rate of growth of any other area of work in the history of applied psychology in this country. Furthermore, these figures do not include numerous cases of college faculty members who divide their time between personnel work and teaching, as all those who indicate that they spend part time teaching courses not directly related to the field of personnel work were classified as teachers and not included in this category.

The term "Industrial Psychologist" has been used here to refer to any psychologists who appeared to be employed full time in industrial, commercial and similar private enterprises, and includes persons devoting their time to advertising and marketing, personnel work, research and other activities that were not readily defined from the directory listings. This group is the only one that has not increased since 1938. During the earlier years of the decade, however, there had been a rapid gain. Since this type of work is frequently done on a consulting or some other part-time arrangement these figures should not be taken as measures of the total work being done in industrial psychology by members of the American Psychological Association.

The next group, "Consulting Psychologists" was restricted to include only those persons who seemed to be spending their time practicing on a fee basis. Their work no doubt covers a wide variety of problems, and in many cases is similar to some of the work done by persons whose jobs have been placed in the first four groups. Here also it should be noted that many psychologists who do part-time consulting work are omitted. There could be cited numerous examples of psychologists who do extensive work as consultants, but who hold teaching positions, and whom we have classified as teachers.

The attempt at classification of research workers was abandoned on the ground that the information carried by the directory was often insufficient for this purpose. As a result 164 persons have been grouped together here without adequate descriptions of the work being done by some of them. A few are improperly included in the total of 888 mentioned earlier, as their work is almost surely not applied psychology. There are among the 184 at least 32 who are doing educational research, and 35 research workers who are employed in governmental agencies. The third largest subdivision of the research group is clinical, with smaller numbers working on animal, physiological, genetic, theoretical and miscellaneous problems.

The foregoing suggests that there has been a rapid expansion of employment opportunities in applied psychology. Whatever conclusions are drawn at this point, however, must take into consideration certain limitations of the data that can be compiled from the directory of the American Psychological Association. First of all, only part of the applied psychologists employed in this country are covered by this membership list. There are many jobs in applied psychology which have not been considered in this study because no data

on them were available. Furthermore, it is possible that the increase in the membership of the Association is changing the percentage of all applied psychologists included in successive directories. Insofar as new members come from the ranks of previously employed applied psychologists, the apparent changes are obviously not increases in employment. While it is difficult to determine exactly how frequently this occurs, there seem to be relatively few cases of this kind.

It is possible that some of the apparent increase in certain types of work is due to changes in terminology instead of any fundamental changes in the work being done. There have come to light at least a few instances suggesting that this may be occurring occasionally in the case of personnel work. It is certain that there have been many psychologists in colleges and universities whose work has included counseling and related activities, but whose job titles gave no indication of that fact. As personnel work has become more fashionable, this may not hold true to the same degree as was the case earlier. It seems safe to assume that this inadequacy of the data results in underestimating the extent to which psychologists are engaged in applied work, but there are no means for determining whether it affects the earlier or later data more extensively.

Many of the psychologists who have been classified as teachers are primarily interested in applications of psychology, and spend part of their time in applied work. No attempt has been made to discover how much part-time work in applied psychology is ignored by the methods that have been used in this study.

Despite all of the limitations of the data and the methods by which they have been treated, the conclusion that employment in applied psychology is continuing to increase is sound.

TYPES OF TOTAL SCORES ON MENTAL TESTS WITH SPECIAL REFERENCE TO A MEDIAN SCORE ON A BINET-TYPE SCALE[1]

By F. KUHLMANN

DIVISION OF SOCIAL WELFARE, DEPARTMENT OF SOCIAL SECURITY, ST. PAUL, MINNESOTA

THE object of the total score on any scale or battery of mental tests is to give an expression of the average level of abilities of the individual tested. It is recognized that these abilities are numerous and that the number of tests that can be used in any scale in order to keep the time required to give them within practical limits samples only relatively few of these abilities. It is essential, therefore, that any method of computing the total score prevent the score on any one test from contributing more than its share to this total. To the extent that the method departs from this requirement it becomes possible for the total score to represent some special ability or disability that is measured by some particular test rather than the average level of all abilities measured, as well as to be unreliable because of temporary disturbing factors affecting one or two tests only.

The nature of any scale or battery in question determines the method by which the desired objective can be best attained. In all, the computation of the total score begins with the assumption, tacit or actual, that a certain minimum average level has already been determined. Finding the total then consists of adding to this minimum some form of extra credits.

Of the several different procedures the least satisfactory is represented by the group test battery whose total score is simply the sum of raw scores on the separate tests in the battery, when the separate tests contribute widely different amounts to the total score, because of unequal number and difficulty of trials, which total is then usually transmuted into mental age or other more useful measures than the raw score itself would furnish. With all group test batteries, the battery used must fit the general level of the individuals tested. By such fitting it assumes that the individuals to be tested are above a certain level. The battery really measures only a limited range or sector of development, the range that lies beyond this point of assumed minimum.

The fault of unequal weighting of different tests in their contribution to the total score may be removed largely by scaling the raw scores on each test in the battery instead of only the total score on the battery. These raw scores may in each case be converted into scores using a common unit, such as mental age or the standard deviation. When these converted scores are added for a total score unequal weighting will still occur when an unusually low or high score is earned on some test because the individual tested is unusually weak or strong in the particular ability

[1] This paper was submitted for publication in the JOURNAL by the late Dr. Kuhlmann on December 5, 1940.—EDITOR.

measured or because of some temporary factor affecting it. Only the unequal weighting due to unequal number and difficulty of trials in the raw scores of different tests will be eliminated.

Complete equal weighting may be attained by using the median of these converted scores for the total score. The raw scores on each test, for example, may be converted into mental ages, and the median of the several mental ages may be taken as the mental age of the individual tested.

In order to get the full advantage of using the median of the scores on the separate tests for the total battery score certain other conditions must be fulfilled.

The range of possible scores after conversion into a common measure should be approximately the same on each test, in order to give the same opportunity for high and low scores on all the tests. It should be wide enough to avoid an undue number of zero and maximum scores. Range may be increased by adding to the number of trials, by shortening the time allowed for the test, or by rapidly increasing the difficulty from one trial to the next. A combination of the first and third is probably the best procedure. Each test can then begin with quite easy trials, which will eliminate zero scores. The rapid increase in difficulty will avoid an undue number of easy trials as well as eliminate maximum scores. A large number of relatively easy trials of the same or of slightly increasing difficulty is especially undesirable because it tends to make it a speed test for the average and brighter in the group tested, and is detrimental to good motivation. To a large extent children and adults alike adjust their effort to the difficulty of the task presented. In a test with many trials that are easy for the average and brighter in the group tested, the relatively dull will work with good effort and the others will work with poorer effort, resulting in a tendency to give the same score to all.

Similar observations apply to the mid-points of the ranges of scores on the separate tests. These mid-points may be of the same degree of difficulty, or may increase in difficulty in successive tests. Assuming that the range of converted scores was always the same in all tests, the battery made up of tests whose mid-point scores were all of the same difficulty would have a smaller battery range of scores than would the battery in which the mid-point scores increased in difficulty in successive tests. Assuming further that the two kinds of batteries were of the same general degree of difficulty by having the mid-point score that is the same in all tests of the first battery coincide with the mid-point score of the middle test in the second battery, then the second battery would give a smaller number of both zero and maximum scores for any group of subjects in which the range of abilities extended below and above the range of either battery. In other words, the mid-point scores should increase in difficulty in successive tests in any battery in order to give the battery a wider range of abilities that it measures, and in order to reduce the number of zero and maximum scores.

The complete test scales for individual examination meet somewhat different problems in computing the total score. The requirements of the separate test in the scale vary with different parts of the scale, and this affects the procedure in getting the total score. The way in which the scale has been constructed with reference to locating each test at its particular point in the scale is another determining factor in

the procedure to be adopted. In all these scales that cover the whole range of mental development from an early age to maturity the question of selecting and fitting the tests to be used to the ability and requirement of the subject to be tested, as in the case of fitting the difficulty of the battery of group tests to an assumed average ability of the group to be tested, does not arise. In the use of the individual test scale that point is determined by continuing to give tests lower in the scale until no further failures occur or would be likely to occur if still easier tests were given. Getting the correct total score on the scale then depends on how the extra credits are counted, which in turn depends on how the scale has been constructed.

Let us consider the individual test scale of the familiar Binet-type. The procedure of adding $\frac{12}{x}$ months to the basal mental age (point below which no failures have occurred) for every test passed above this basal age, where x is the number of tests used in each age group, to get the total score in terms of mental age, appears quite simple. As a matter of fact, however, rather complicated conditions must be fulfilled for this procedure to give correct results. The tests must be arranged in order of difficulty and must be of such a degree of difficulty in each age group as to make this procedure give correct mental ages. When this is done it is found that this difficulty must constantly increase from lower to upper age groups. At the three-year level, for example, nearly a hundred per cent of non-selected three-year-olds must pass a test in order to correctly place it in the three-year-age-group. Towards the upper end of the scale, say at the twelve-year level, not much over fifty per cent of non-selected twelve-year-olds must pass a test in order to correctly place it in the twelve-year age group. This is necessary because of the fact that the mental growth curve of the average child is negatively accelerated. During each year the child grows less mentally than he did during the preceding year. If now the tests in successive age groups were made equally difficult, instead of increasingly more difficult, so that tests in the six-year group, for example, were of the same difficulty for six-year-olds as tests in the seven-year group were for seven-year-olds, then the number of extra tests passed above the basal mental age would increase in passing from the lower to the upper part of the scale. It still does increase considerably in a Binet scale, because the basal age is pushed further below the mental age as we go up in the scale, and more extra credits are needed to get correct mental ages.

A matter that has aroused considerable discussion in scoring Binet tests is the "all-or-none" method of allowing credit for performance on the separate tests in the scale. It is held that the credit allowed should be in proportion to the number of trials done correctly, where there is more than one trial, instead of giving a fixed credit for a given number of trials and no credit at all if a smaller number of trials is done correctly.This argument overlooks more important requirements for tests in the lower part of the scale where young children are concerned. Here a test of few trials that are the same in difficulty is needed to get the necessary attention and effort for some one trial and thus determine whether the child can pass at this level. But in the upper parts of the scale it is undoubtedly a better plan to use tests with larger numbers of trials and then allow credit more in propor-

tion to the number of trials done correctly. More is involved than simply the error in throwing away part of the result in allowing only full credit for a given number done correctly and no partial credit. Such a test measures better whatever it does measure than any short test does, independently of how it is scored. For every test a certain comprehension of the task, an adjustment or "set," and "warming up," is required. With a rapid succession of short tests each taking only a few seconds adequate opportunity for this is not always given.

When in a Binet scale a test with many trials is scored only at one level by the "all-or-none" method it is of considerable importance whether the credit given involves only one or two correct trials and placement in a low age group, or near the maximum number of correct trials and placement in a correspondingly high age group. Probably either way would make it less reliable than when scored and placed on the basis of a correct response on a fourth to half of the trials. In the former case one of the faults would be the more or less frequent discouragement in making any attempt at all because of too great a difficulty of the task presented. In the latter case the test would tend to become largely a speed test, which also results in variable effort. Of course, scoring a test only once in a Binet scale means that more tests will be required to make up the scale than when a single test is scored at several different levels. Within the limits in which this is feasible it has the advantage of resulting in a wider sampling of the child's abilities and of avoiding undue weight being given to the score on any one test.

The second way of using a test with many trials in a Binet scale is to place and score it at more than one point in the scale according to the number of trials done correctly. This has been done to a limited extent in Binet scales, for it does not require any change in the method of computing the total score. It is not possible, however, to allow additional credit for every additional trial done correctly without complicating the procedure in getting the total score on the scale. At each point in the scale where a test is scored it must be treated as though it were a different test. The number of points where it can be scored is determined by other scale requirements such as having the same number of tests in each age group, and not by the number of trials in the test. Consequently, one such test may, for example, be scored for two trials and for four trials answered correctly, while another may be scored for three, five, and seven trials answered correctly. Usually only a rather rough approximation to allowing full credit for the number of trials done correctly is possible in a Binet scale. While this multiple scoring of a test does not affect the Binet rule of computing the total score, so long as the same number of scorings occurs in each age group independently of the number of tests involved, it does tend to give greater variability in the total scores among individuals in a group and in reexaminations. That much follows from the smaller number of tests in the scale and from the greater weight given to the score on each separate test, both because of the smaller number of tests and the multiple scoring on it.

If all the tests in a Binet scale were made up of a considerable number of trials, assuming for the moment that this is feasible, and the raw scores on each test were converted into a common measure, such as mental age, it would be possible to combine the Binet rule of computing the total score on the scale with the median mental age method, and

thus make use of the advantages of both. One could use the basal point below which no failure had occurred to determine the tests on which a median mental age might be computed. Assuming for example, a case whose first failure was on the last test in the eight-year group, this median mental age would be computed on the tests above this in the scale on which scores had been obtained. The tests above the basal point would be treated from this point on as an independent battery. But, of course, the composition of the battery would be determined by the basal point, that is, by all of the preceding part of the scale. The determination of the basal point insures the best possible fitting of the tests on which the median is computed to the requirements of each individual case.

The writer's *Tests of Mental Development, A Complete Scale for Individual Examination*,[1] while not a Binet scale, follows the Binet method in principle of computing the total score. Also, all the tests from about the eight-year level up have a considerable number of trials, so that a median score on any combination of them may be computed. A different procedure from that used in constructing a Binet scale was followed. This has some bearing on the total score obtained and on the method of computing it.

Instead of placing or scoring tests at successive year-levels they were scored at successive points on the Heinis' mental growth curve, at intervals of three points on this curve. The writer was satisfied that the points on this growth curve represented true units of mental development as measured by most mental tests, instead of a unit of decreasing value as given in the year and month. If this assumption was correct it seemed that the highly objectionable procedure of shifting tests about in a preliminary scale by the "trial and error" method, until median mental ages obtained on the scale agreed with the chronological ages of the children tested might be avoided. The score required for passing any test located at any given point on the growth curve would be the fifty percentile score, instead of the variable percentile ranging from nearly one hundred at the lower end of the scale to nearly fifty at the upper end. This assumption was tried out and found to be correct. The total scores for the children in the norm data were computed by adding three points in the growth curve for every pass on a test to the basal point on the scale below which there were no failures, except where two different tests were scored at the same point in the growth curve. In the latter case each pass on a test was counted for one and a half points. This applied to all of the upper half of the scale, and intermittently below this. This procedure reduced by half any undue effect on the total score of an unusual high or low score on some one particular test. These total scores were then converted into mental ages and I.Q.'s, which gave the following correspondence between ages and median I.Q.'s.:

Age	0-6	0-9	1-0	1-6	2-0	2-6	3-0
Median I.Q.	1.00	1.02	1.01	.99	1.04	1.02	1.01

Age	4-0	5-0	6-0	7-0	8-0	9-0	10-0
Median I.Q.	1.02	.98	1.00	.97	1.00	1.00	1.00

Age	11-0	12-0	13-0	14-0	15-0	16-0
Median I.Q.	1.00	.98	1.01	1.00	.98	.99

To avoid some of the objectionable features mentioned in scoring and placing the separate test in the scale, and their possible effect on the total score,

[1] Minneapolis, Minn.: Educational Test Bureau, Inc., 1939.

any one test was scored only from four to six times, beyond about the middle of the scale, not at *every* three points in the growth curve. To secure a scoring at every three points in the growth curve scale, the placement of tests was staggered. The following section of the scale will illustrate the arrangements.

Growth curve	333	336	339 etc.	366	369	372 etc.
Test 79	X			X		
Test 80		X			X	
Test 81			X			X

Test 79 was scored at the growth curve points 333, 366, and other points beyond. Test 80 was scored at 336, 369, and other points beyond. Other tests were scored first at the intervals intervening between 339 and 366. Still other tests, staggered in like manner, overlapped with these and others, so that two tests scored at each third point in the growth curve. For example, test 69 scored at 333 with test 79; test 76 scored at 336 with test 80.

A test was not scored where only one or two trials were passed, nor near its upper range where nearly all trials were passed. This avoided scoring a test where it was either too difficult or too easy to give maximum reliability. Scoring a test at a maximum of six points in the scale limited the weight it could have in the total score, as well as did the scoring of a second test at each of these points and then allowing half as much credit to each. In general, the procedure was a compromise between the "all-or-none" method of scoring and that of allowing full credit for all the trials done correctly.

Age norms with their corresponding growth curve values were computed for every trial in each test. This makes it possible to drop the old Binet procedure of adding extra credits to a basal age earned on the scale, and use the median mental-age method instead, when the basal age is at about the eight-year level or higher. This combines three procedures, each of which is of major importance in obtaining the best possible total score. First, the determination of the "basal" mental age with the preceding part of the scale insures accurate fitting of the remaining tests to be used to the requirements of each individual case. Second, credit is given on each of the remaining tests used in proportion to performance on it; no part of the score earned is thrown away. Third, proper weighting is still given the score on each test by using the median score for the total score on the scale.

It seemed logical to assume that scoring by the median score method would on the whole give the same results as the method now described in the writer's manual. This assumption was tried out by scoring a number of cases by both methods and comparing results on the two. In order to get information also on how the methods compared on re-examinations as well as on first examination, the re-examinations that had accumulated in the routine work of Section on Mental Examinations in the Minnesota Division of Social Welfare were selected first for scoring by both methods. To these a few cases with only one examination were added later. The great majority of all cases was below average intelligence, but necessarily with mental ages from about eight years and up. Many of the cases with re-examination were examined first when some social problem had become acute, and were re-examined soon after commitment to a state institution. This may be the reason why the difference between first and second examinations is larger on the whole than in most of our other results.

The scoring by the median score meth-

od was done, with negligible exceptions, on sixteen tests. Beginning with the highest test in the scale that had been given and on which there was no zero score, we counted downward for sixteen tests. Any tests with zero scores within these sixteen were included in the scoring. The interval between first and second examination on the re-examined cases varied from a few days to as many years. In order to eliminate the complication of the general tendency of low I.Q.'s to decrease, all results were scored in terms of the Heinis' "Personal Constant," renamed "Per cent of Average" (P.A.) by the writer, which tends to remain constant.

Adding all first and second examinations together, gave 445 cases. The average P.A. score by the Manual method was .929, and by the median score method it was .927. Among the 445 examinations were 259 first examinations and 186 re-examinations. In the first examinations the average P.A. score was .919 by the Manual method and .918 by the median score method. In the re-examinations the average P.A. scores were .943 by the Manual method and .939 by the median score method.

For the 445 examinations the average difference between the two methods of scoring was 1.76 P.A. points. The difference was not over:

0 points in 19 per cent
1 point in 54 per cent
2 points in 78 per cent
3 points in 89 per cent
4 points in 94 per cent
5 points in 97 per cent

The distribution of the differences between the P.A. scores on the two methods was as follows:

No. Points	0	1	2	3	4	5	6	7	8
No. cases	84	157	104	51	23	13	5	3	1

No. Points	9	10	11	12	13	14	15
No. cases	2					1	1

For the 186 re-examined cases the average change on the second examination was 3.51 P.A. points when scored by the Manual method, and 3.29 P.A. points when scored by the median score method.

The distribution of the changes on the second examination was as follows:

No. Points	0	1	2	3	4	5	6	7
Manual-No.	16	41	28	24	27	12	19	6
Median-No.	14	40	28	30	28	17	11	8

No. Points	8	9	10	11	12	13	14	15
Manual-No.	3	3	3		1			1
Median-No.	2	2	2	3				

No. Points	16	17	18	19	20	25	37
Manual No.						1	1
Median-No.					1		

In these data the change on re-examination when scored by the Manual method was larger than when scored by the median score method in 81 cases, smaller in 70 cases, and the same in 35 cases. There were seven cases for which the change on re-examination when scored by the Manual method was over nine P.A. points. In all of these seven cases the change was smaller when scored by the median score method.

It should be noted in all these comparisons of the two methods of getting a total score that, with few exceptions, five tests were regularly omitted in the examinations. These were some of the second tests that are scored at the same points in the scale where another test is also scored. By giving each of the two tests scored at the same point only half the usual credit the possibility of the total score being unduly affected by an unusually high or low score on one test is thereby reduced by one-half. Had

these five tests not been omitted in the examinations it would, of course, have reduced the difference between the total scores obtained by the two methods.

The median score method is simpler and takes considerably less time. When in a Binet scale as in that of the writer's Tests of Mental Development a test is scored at several different levels the score required for passing at each of these levels must be noted and the test scored at each. With the median score method only one score on the test is noted and it is scored only once in the score card or score record. When this is done the scores on the different tests are automatically arranged in order of magnitude. The final step of counting from either end to the mid-score then takes only a few seconds. This step takes the place of noting the basal mental age, counting up the extra credits and adding them to the basal level in the other method.

SUMMARY

1. The median score method is applicable in a Binet-type scale if each of the separate tests in the scale has a number of trials and the score on each is converted into a common measure, such as mental age.

2. With the writer's *Tests of Mental Development* the median score method gives total scores (mental ages) that are on the average identical with those obtained when the Binet method of finding basal mental age plus extra credits is used.

3. When it is used with a Binet-type scale the function of the preceding part of the scale that is used becomes that of determining the part of the scale, or group of tests, that is best fitted in difficulty and other requirements for obtaining an accurate median score.

4. The median score has the important advantage of giving equal weight to the scores on the separate tests, and therefore, gives more accurate results in certain cases whose response has been particularly poor or good on a few tests only. It increases reliability in general, and materially reduces changes on re-examinations.

5. The median score method makes the examination more flexible because the omission of any test or two that may be necessary for some reason, or abbreviating the whole examination by the omission of any number of tests, does not affect the scoring procedure.

6. The method is simpler and computing the mental age of a case takes less time.

THE DERIVATION OF THREE SUBSCORES FROM THE 1937 REVISION OF THE STANFORD-BINET SCALES

By FREDERICK B. DAVIS

COOPERATIVE TEST SERVICE OF THE AMERICAN COUNCIL ON EDUCATION

IT has long been common practice for clinical psychologists reporting the results of an administration of the 1916 revision of the Stanford-Binet Scales to comment on the subject's performance on various groups of items which were assumed to measure approximately the same mental functions. All of the digit-span tests, for example, have usually been lumped together under the heading "Auditory Memory." Other groups of items have been labelled "Visual Memory," "Ideational Thinking," "Practical Judgment," etc. The sort of subjective interpretation which has often been written on the basis of an individual's record of passes and failures is illustrated by the following example:

> Charles established a basal level at age XII. At age XIV he failed the "clock test." At the *Average Adult* level he failed the "vocabulary," the "differences between abstract words," and the "repetition of six digits backward." At the *Superior Adult* level he failed all of the items. His vocabulary level appears to be somewhat lower than his total mental level, his visual memory is poor, and his auditory memory is also low. On the other hand, his abstract thinking appears to be good.

Such interpretations are highly subjective and unreliable, but they are based on clinical observations which may be of considerable value. In an effort to obtain more reliable analyses of passes and failures on the items in the 1937 revision of the test, a convenient procedure has been developed by which three subscores may be obtained for subjects whose basal ages on Forms L and M are at age *IX* or higher. These three subscores are intended to provide measures of vocabulary, memory, and reasoning. The per cent of the total mental age credit above year *IX* which each of these represents in Form 1916 and in Forms L and M of the Stanford-Binet Scales is shown in Table I.

TABLE I

PER CENT OF TOTAL MENTAL AGE CREDIT ABOVE YEAR *IX*

Form	Reasoning Subscore	Memory Subscore	Vocabulary Subscore
	Per Cent of Total	Per Cent of Total	Per Cent of Total
1916	50	27	23
L	50	21	29
M	46	29	25

The assignment of each item to one of the three groups, Reasoning, Memory, or Vocabulary, was made on the basis of its apparent content, its scoring requirements, as stated and illustrated in the accompanying Manual, and the ways in which subjects have actually dealt with it in the testing situation. The resulting classification of most items seems reasonably acceptable, but there were some which were not readily

classifiable. Such items were simply placed in the groups in which they seemed most properly to belong.

After this classification had been made, 136 Stanford-Binet Record Booklets were rescored to obtain the three subscores. All of these examinations had been administered to secondary-school boys, most of them at the time of application for admission to Avon Old Farms, a college preparatory school for boys at Avon, Connecticut. Eighty-seven boys had been tested with Form L and forty-nine with Form M. When the subscores had been obtained, their intercorrelations were calculated separately for Forms L and M. The correlations between chronological age and each of the three subscores for both forms were also computed and from these data partial correlation coefficients between each pair of subscores were calculated. The correlation coefficients between chronological age and each of the subscores are presented in Table II.

TABLE II

PRODUCT-MOMENT CORRELATION COEFFICIENTS BETWEEN CHRONOLOGICAL AGE AND STANFORD-BINET SUBSCORES

	Form L (N=87) Chronological Age	Form M (N=49) Chronological Age
Reasoning Subscore	.23	.46
Memory Subscore	.28	.16
Vocabulary Subscore	.34	.53

The partial correlation coefficients, chronological age being held constant, between each pair of subscores are shown in Table III.

These partial correlation coefficients indicate that, considering their reliabilities, the three subscores are fairly closely related. This would be expected in view of the method used in constructing the Stanford-Binet Scales. Nevertheless, some individuals differ considerably in their abilities in these three groups

TABLE III

PARTIAL CORRELATION COEFFICIENTS, CHRONOLOGICAL AGE HELD CONSTANT, BETWEEN STANFORD-BINET SUBSCORES

Form L (N=87)		
	Memory	Vocabulary
Reasoning	.66	.66
Memory		.50
Form M (N=49)		
	Memory	Vocabulary
Reasoning	.40	.67
Memory		.37

of items. For this reason, subscores for both forms of the 1937 revision have been equated and placed in parallel columns, as shown in Tables IV and V, so that an individual's ability in each of

TABLE IV

EQUATED SUBSCORES ON REASONING, MEMORY, AND VOCABULARY, STANFORD-BINET, FORM L

Reasoning Subscore	Memory Subscore	Vocabulary Subscore
81	36.0	49.0
78	33.5	48.0
75	31.5	46.0
72	29.5	43.5
69	28.0	41.0
66	26.5	38.5
63	25.0	36.5
60	24.0	34.5
57	22.5	32.5
54	21.0	30.5
51	19.5	28.0
48	18.0	26.0
45	17.0	24.0
42	16.0	22.0
39	15.0	20.5
36	14.0	19.0
33	13.5	18.0
30	12.5	17.0
27	11.0	16.0
24	9.5	14.5
21	7.0	13.5

the three subscores may be indicated in convenient graphic form.

The classification data required for the use of Tables IV and V are presented in Tables VI and VII. Detailed directions for the use of these classification tables are as follows:

1. Use the classification table which corresponds with the form (L or M) of the Record Booklet to be rescored.
2. Find the subject's basal level in the Record Booklet (the year level at which all of the items have been passed).
3. On the appropriate classification table, find the horizontal section corresponding to the year level of the subject's basal mental age. If this were *XIII*, for example, one would look at the sections marked *XIII* on the classification table.
4. Note that the subscore credit allowed for each item for year *X* and above is printed in the column to the right of the item number. For each item at the subject's basal mental age level, write the proper subscore credit in the appropriate column headed "Total Credit."
5. For each year level below the subject's basal mental age level and above year *IX*, write the proper subscore credit for every item in one of the three columns headed "Total Credit."
6. Find which items the subject has passed at the levels above his basal mental age level. For each item which he has passed, write the proper subscore credit in the appropriate "Total Credit" column.
7. Add up the subscore credits which have been placed in the three columns headed "Total Credit." Record the total for each of the three columns in the spaces provided at the bottom of the table.
8. Refer to the appropriate table of equivalent subscore values and make a mark on the vertical line headed "Reasoning Subscore" at the point corresponding to the total Reasoning Subscore. Follow the same procedure for each of the other two vertical lines. Interpolation may be used to find the proper places for marking the vertical lines.

An illustration of the method of computing the subscores may serve to clarify these detailed directions. Form M of the 1937 Revision of the Stanford-Binet Scales was administered to Richard Jones, who passed all of the items at the *Average Adult* level, passed Items 1, 3, and 6 at *Superior Adult I*, passed Items 1, 2, and 3 at *Superior Adult II*, and failed all of the items at *Superior Adult III*, except for Number 3. His total subscore credit is as follows: Reasoning, 64; Memory, 16; and Vocabulary, 29. When these subscore totals are marked on the graph for Form M (Table V), it is apparent that Richard's reasoning ability and vocabulary appear definitely better than his memory, his reasoning ability being highest.

TABLE V

EQUATED SUBSCORES ON REASONING, MEMORY, VOCABULARY, STANFORD-BINET, FORM M

Reasoning Subscore	Memory Subscore	Vocabulary Subscore
75	48.0	43.0
72	39.0	40.0
69	35.0	38.5
66	33.0	37.0
63	31.5	35.5
60	29.5	33.5
57	26.5	31.0
54	24.0	28.5
51	22.5	27.0
48	21.5	26.0
45	20.0	25.0
42	18.0	23.0
39	17.0	21.0
36	15.5	19.5
33	13.5	17.5
30	12.5	16.5
27	11.0	15.5
24	9.5	14.0
21	8.0	12.0
18	6.5	10.0

TABLE VI

A CLASSIFICATION OF ITEMS ABOVE YEAR IX, THE STANFORD-BINET SCALES, FORM L

Reasoning Subscore				Memory Subscore				Vocabulary Subscore			
Year Level	Item No.	Subscore Credit	Total Credit	Year Level	Item No.	Subscore Credit	Total Credit	Year Level	Item No.	Subscore Credit	Total Credit
X	2	2		X	3	2		X	1	2	
	4	2			6	2			5	2	
XI	2	2		XI	1	2		XI	3	2	
	5	2			4	2					
	6	2									
XII	2	2		XII	4	2		XII	1	2	
	3	2							5	2	
									6	2	
XIII	1	2		XIII	2	2		XIII			
	3	2			6	2					
	4	2									
	5	2									
XIV	2	2		XIV				XIV	1	2	
	3	2							6	2	
	4	2									
	5	2									
Average Adult	2	2		Average Adult	7	2		Average Adult	1	2	
	4	2							3	2	
	5	2									
	6	2									
	8	2									
Superior Adult I	2	4		Superior Adult I	4	4		Superior Adult I	1	4	
	6	4							3	4	
									5	4	
Superior Adult II	2	5		Superior Adult II	3	5		Superior Adult II	1	5	
	4	5			6	5					
	5	5									
Superior Adult III	2	6		Superior Adult III	6	6		Superior Adult III	1	6	
	4	6							3	6	
	5	6									
TOTAL SUBSCORE				TOTAL SUBSCORE				TOTAL SUBSCORE			

Four limitations which affect the interpretation of these three Stanford-Binet subscores should be mentioned. The first is that all of the subjects whose Record Booklets were available for rescoring and for equating the subscores were boys. Because items on which boys and girls obtained significantly different scores were eliminated from the 1937 revision of the Stanford-Binet Scales, this factor is probably of little significance. Second, the classification is limited to age level *IX* and above because all of the available cases were secondary-school pupils. Third, the average I.Q. of the 136 available cases was 119. Thus, the equating was based on the scores of subjects of superior intelligence. Fourth, the number of available subjects was relatively small, especially

TABLE VII

A CLASSIFICATION OF ITEMS ABOVE YEAR IX, THE STANFORD-BINET SCALES, FORM M

Reasoning Subscore				Memory Subscore				Vocabulary Subscore			
Year Level	Item No.	Subscore Credit	Total Credit	Year Level	Item No.	Subscore Credit	Total Credit	Year Level	Item No.	Subscore Credit	Total Credit
X	1	2		X	2	2		X	4	2	
	3	2			6	2			5	2	
XI	1	2		XI	2	2		XI	4	2	
	3	2			6	2					
	5	2									
XII	2	2		XII	1	2		XII	3	2	
	5	2			6	2			4	2	
XIII	1	2		XIII	2	2		XIII	4	2	
	3	2			6	2					
	5	2									
XIV	1	2		XIV				XIV	4	2	
	2	2									
	3	2									
	5	2									
	6	2									
Average Adult	2	2		Average Adult				Average Adult	1	2	
	4	2							3	2	
	5	2							7	2	
	6	2									
	8	2									
Superior Adult I	3	4		Superior Adult I	4	4		Superior Adult I	1	4	
	6	4							2	4	
									5	4	
Superior Adult II	1	5		Superior Adult II	4	5		Superior Adult II	3	5	
	2	5			6	5					
	5	5									
Superior Adult III	1	6		Superior Adult III	2	6		Superior Adult III	5	6	
	3	6			4	6					
					6	6					
TOTAL SUBSCORE				TOTAL SUBSCORE				TOTAL SUBSCORE			

in the case of Form M.

Despite these limitations, experience has shown that the three subscores are helpful in interpreting the results of an administration of the Stanford-Binet Scales.[1] The unique possibilities of the use of an individual examination of this sort lie in the information which is obtained in addition to the single mental age score. By helping to organize such additional information, these subscores are of definite clinical value.

[1] Tables IV-VII may be obtained at cost in a form convenient for clinical use from Frederick B. Davis, 15 Amsterdam Avenue, New York.

BOOK REVIEWS

MATCHING YOUTH AND JOBS. By Howard M. Bell. Washington, D. C.: American Council on Education, 1940. Pp. 277. $2.00.

After preliminary discussions and reports on the conditions that were creating a "youth problem," the American Youth Commission decided in 1936 that jobs were absolutely essential in any solution of their problem. It was pointed out that in every community there are a great many different groups anxious to see that young people secure appropriate employment, but that each group tends to work independently and therefore ineffectively. The two government agencies most vitally concerned with the occupational adjustment of all young people are the schools and the public employment service. It was proposed that a cooperative study of the occupational adjustment of young persons be undertaken by the American Youth Commission and the Occupational Research Program of the United States Employment Service. This book is the published report of that cooperative experiment.

This report is addressed to the public through the American Youth Commission. It does not attempt to provide technical help in guidance procedures, but it does make a strong case for guidance and a powerful plea for cooperation among the various community agencies that are interested in helping young people to achieve more effective occupational adjustments. It is repeatedly pointed out that the schools cannot effectively carry on their educational function without being deeply concerned with the vocational possibilities of their students and that the employment service cannot be highly effective without the pertinent information about the youth which schools should be constantly accumulating.

In summarizing his discussion of the placement office as the active focus of community agencies in matching youth and available jobs, Bell has this to say: "It can also render a service to the youth and to the whole community by making the modest effort involved in directing the majority of young applicants for whom no jobs can be found to those community agencies and activities which were created, or could be developed, to serve them. For millions of young Americans, there is and can be no real substitute for a real job. But there are some excellent substitutes for a park bench."

Providence, Baltimore, St. Louis, and Dallas were the four urban centers in which the experimental cooperative studies were conducted. The pattern of community organization for the guidance of youth was somewhat different in each center in order to help determine what plans are most effective. It would seem from Bell's report that the effectiveness of the guidance service available to young people depends far more on the quality of the leadership and cooperation in the community than upon the administrative organization pattern. The local labor market is recommended as the most desirable occupational adjustment community.

The book is interestingly written, well organized and illustrated, and can be highly recommended as a tool in gaining active support for community guidance services. Its point of view and general recommendations are sound.

M. R. TRABUE

THE PENNSYLVANIA STATE COLLEGE

PERSONALITY AND PROBLEMS OF ADJUSTMENT. By Kimball Young. New York: F. S. Crofts & Co., 1940. Pp. 868. $4.25.

Kimball Young's latest book inevitably suggests comparison with his earlier *Social Psychology*. The approach of both books is much the same as is some of the ground covered. The recent *Personality and Problems of Adjustment*, however, amplifies the earlier discussion and brings in up-to-date research material. The book is divided into three major sections: 1) The Foundations of Personality, 2) Selected Problems of Personal Adjustment, 3) Certain Wider Implications. The first part, comprising thirteen chapters, is devoted to a survey of the research in personality development, theories of personality, and methods for studying or measuring personality. The second part, comprising fifteen chapters, gives a somewhat more practical discussion of child growth and educational processes, marriage problems, delinquency and personality maladjustment in

relationship to social factors. The third part, comprising two chapters, is a brief treatment of personality disintegration with some suggestions for integration in the light of contemporary conflicts between democratic and totalitarian ideas. There is in an appendix, an outline for writing a case history and the customary bibliography and indexes of names and subjects.

In treatment, the book presents a compilation of research and rival theories with critical comments by the author. He takes a midposition in most of the theoretical controversies, seeking a compromise between advocates of heredity and environment, between the atomism of the stimulus-response school and the organismic point of view. Young labels his position as "interactionism," a point of view which leans heavily upon the introspectionist theories of G. H. Mead. As a compiler, Young is valuable. He brings to a single focus the accumulated research and theorizing to the date of writing. And because he does not have any startling theories of his own to propound, he gives the student an excellent and balanced review of progress in social psychology.

On the other hand, Young's style is a bit labored and his reasoning close. The book is bulky and free from illustrations, though an occasional chart enlivens the pages. The type is a little small for comfortable reading. It should be a most useful introductory text for graduate students. It is more detailed than is necessary for undergraduates. Because of the large amount of territory covered it cannot discuss "selected problems" in sufficient detail to serve as more than an introduction for gradaute students. The book will also serve well as a reference volume for those who do not follow closely the developments in social psychology. There is place every ten years or so for a review of the type offered by Young. This is true even though the *Experimental Social Psychologies* of Murphy, Murphy and Newcomb cover somewhat the same territory. Young's approach is more from the point of view of specific practical problems in education, marriage, crime, and so on.

Only those who have some pet social theory to defend will quarrel with Young's treatment. He is an electric, borrowing from various schools of psychology, sociology, psychiatry, and anthropology to make as balanced a synthesis as possible. Some experts on child development might find minor conclusions on child growth less than adequate; certain psychiatrists might question the classification of mental disorders, and so on. But most of this would be caused by quarrels on fine points among the experts themselves. When we realize that Young's purpose was to present a judgement in the midst of controversy rather than to announce new theories, the value of the book is clear. Young has demonstrated again familiarity with a wide range of materials and an ability to handle these in a sympathetic manner.

WILLIAM W. BIDDLE
STATE TEACHERS COLLEGE
MILWAUKEE, WISCONSIN

INTRODUCTION TO HIGH SCHOOL COUNSELING. By E. G. Williamson and M. E. Hahn. New York: McGraw-Hill Book Co., Inc. 1940. Pp. 314.

The widening scope of the high school curriculum has made increasingly greater demands for guidance services upon counselors, advisers and teachers. To help secondary-school staff members meet these demands and at the same time to offer a text for introductory guidance courses in colleges of education, Williamson and Hahn wrote an *Introduction to High School Counseling*. At best these two purposes are difficult to achieve in the same book. The result is bound to lean in one direction or the other. This volume is obviously a textbook.

The authors begin with a discussion of the development of student personnel work in which they sketchily review six antecedents: the measurement movement, vocational guidance, educational guidance, the clinical method, individualization of mass education and scholastic motivation. Then, in a few pages, they take the reader through conflicting objectives of secondary education to an argument favoring diversity of curriculums for different types of students.

Secondary students' problems to which personnel workers need to give consideration are broadly conceived and, according to the authors, center about: vocational guidance, securing employment after school, social and emotional development, intellectual development, alleviation of moral, religious and philosophic confusion, and health, physical development and adaptation to disabilities. A case history illustrates the scope of student personnel work and there follows immediately stress upon the importance of group work. The rela-

tionship of counseling to the curriculum and instruction is clearly considered with full recognition of the increased possibilities for guidance that the functional curriculums have brought about.

In the chapter on "Collecting Information About Students" the counselor is urged to be "well informed about (1) the characteristics and potentialities of the student, and (2) the influences and resources of school, home and community in which the student's problems arise and in which he must make his adjustments." The case study, information generally available in the school, the use of tests, interviews and community sources are each briefly reviewed although most stress is given to tests.

The process of actually counseling students is well illustrated with case data. Practical suggestions are given for starting and administering the student personnel program and for dealing with out-of-school youth.

The book is written in a clear, simple and direct style. The suggestions given are more helpful and practical for large than for small high schools. Clearly the book is not written for anyone who has read even the elementary works in the field of guidance; it is definitely introductory and should be useful as such.

ALVIN C. EURICH

STANFORD UNIVERSITY

STUDIES IN TOPOLOGICAL AND VECTOR PSYCHOLOGY I. By K. Lewin, R. Lippitt, and S. K. Escalona. Iowa City: University of Iowa Press. 1940. Pp. 307.

This volume represents a new start in a series of Topological Psychology publications and is at the same time a continuation of the series, *Investigations in the Psychology of Action and Emotion*. In the first of the three studies which comprise the volume, Kurt Lewin in his essay "Formalization and Progress in Psychology," surveys the historical development of topological psychology. From an exposition of B. Zeigarnik's work, he points to the multitude of problems including personality and personality development, cognitive structure, social and cultural relations, which are being successfully attacked with the set of topological concepts.

The second part, the ingenious study, "An Experimental Study of the Effect of Democratic and Authoritarian Group Atmospheres," by Lippitt, investigates processes and social resultants of group life under experimentally induced conditions of authoritarian and democratic atmospheres. The field-theoretical approach of the author enables him to analyze his data with a double frame of reference: that of the individual group member and that of the group as a dynamic unity. Utilizing sociometric techniques, playground observations, school records, and teacher interviews, two originally equivalent groups were formed, were provided with an interesting group activity in a physical setting conducive to spontaneous group life. They were then exposed to the major variable, to democratic versus autocratic way of life, thus differentiating functional group properties, goals, ideology, and "style of living." The various child-leader and the child-child relationships were the particular kinds of social relationships which developed differently and were under analysis. Excerpts from the group log combined from the leader's diary and the stenographic record serve to illustrate the various points under discussion and give vivid impressions of the actual development of the group life. While the author does not go systematically into the problem of topological representation of group situations and relations, he stops from time to time in the presentation of the quantitative results to analyze topological and dynamic relationships in the two club situations. When the author presents his results, a fundamental distinction between competitive social relationship which implies insecurity of social status and the cooperative social relationship which demands security of social status becomes evident. In developing, the authoritarian atmosphere tended to bring about increase in the proportion of dominating ascendance, while the democratic atmosphere resulted in an increase in the per cent of friendly and objective components of ascendant behavior. It is also noteworthy that both in terms of number of occurrences and of duration of patterns, the structure of the democratic group maintained a much higher degree of united pattern.

This study of social groups is so pertinent to the burning questions of the present day that it seems scarcely possible to review it in abstractum without considering its practical implications for home, school, and world conditions. With experimental work of this type available, we can well forego vague propaganda for political ideals, but point to facts which we prefer to choose and on which to build our future. This is a type of study which would be difficult to pursue in autocratic countries,

and its interpretation would most likely land the investigator in a concentration camp. The work presents a great contribution to the mental hygiene of group life and stimulates further experimental research into problems of polarization of interpersonal hostilities within a group.

Also, Mrs. Escalona, in the third part of the book in a study on the effect of success and failure upon the level of aspiration and behavior in manic-depressive psychosis, reveals the fruitfuness of Lewin's techniques. In an experimental setting in which the subjects work with paper-and-pencil mazes and with peg boards of different complexities, she studies and compares the behavior of the two extremes of mood disturbances in regard to success and failure and in regard to the shifting of the level of aspiration under the effect of success and failure. While the quantitative results are not conclusive in themselves, they do tend to run parallel and to support the qualitative distinctions of several different types of depressives which she is able to make (motor-retarded, decision-retarded). Thus, her work presents a step towards an experimentally supported independent psychological description of this illness, a differentiation of psychological states in subjects grouped together by psychiatric diagnosis.

The volume as a whole seems a good starting point to plunge into the intricacies of topological psychology for those who have not done so before. The theories are presented in conjunction with substantial experiments. We appreciate the usefulness of Lewin's complex conceptual tools of psychology. Formalization and theory prove their value in serving as means to fruitful progress in finding new knowledge and in furthering deeper insight into psychological processes in a rather new field such as experimental social psychology. Thus, the volume not only serves to further clarify certain concepts, but also serves to focus interest on methods and on theory and proves itself to be one of the most stimulating volumes in a different area of psychological study.

WALLY REICHENBERG
RIVERDALE COUNTRY SCHOOL

OCCUPATIONAL COUNSELING TECHNIQUES. By William H. Stead and Carroll S. Shartle. New York: American Book Company, 1940. Pp. IX plus 273.

This book lies in the field of job analysis and measurement techniques rather than in the area of occupational counseling techniques, in the opinion of this writer. For to him counseling techniques are involved primarily in the process of interpreting data, information and other materials to an individual in terms of his needs to the end that he may make satisfactory choices in the solution of his problems. The techniques involved in obtaining accurate data and information about jobs and about the individual, the subject of this book, while essential to vocational counseling, are preliminary to it.

According to the authors, this book represents the results of the studies of workers for the Occupational Research Program of the United States Employment Service. The authors state two objectives: (1) to understand better the worker's characteristics required for occupations and (2) to devise ways and means of measuring these essential characteristics.

The authors are especially effective in presenting techniques of testing and ways and means of verifying the reliability and validity of test results in the measurement of certain human characteristics. They emphasize three kinds of measurement techniques: (1) measures of occupational proficiency of workers, (2) measures of occupational potentiality of workers and (3) indices of relationships between proficiency and potentiality and the requirements for the job. The authors righly believe that a vocational counselor must know the potentialities of the applicant, the vocational skills which he possesses and the requirements of the job in terms of human characteristics both potential and real before he can be of maximum assistance to the counselee in the solution of his vocational problems.

Chapter V, entitled "The Criterion," is an exceptionally able discussion of criteria for determining occupational potentialities— ways and means of determining the value of human aptitudes and characteristics in terms of potential vocational proficiency. Writers are now pointing out that perhaps the weakest link in psychological measurement is the lack of accurate and reliable means of translating test scores into behavior patterns. This weakness is especially glaring in the occupational area.

The book as a whole is a definite contribution to the areas of measuring human characteristics that have occupational significance and of transplanting these characteristics into oc-

cupational proficiency, both potential and real. One misses certain theoretical considerations which seem essential to the writer as underpinnings to assist in evaluating the contribution of the book, to aid in orienting it in the literature in the field and to clarify the thinking background of those working in the vocational field.

There are certain problems in this area which the writer would like to have seen discussed more fully. For example, the meaning of trait patterns or patterns of human characteristics. What do certain of these patterns mean when translated into vocational proficiency? This problem is the "bottleneck" in the program of the vocational counselor. However, the authors have kept closer to their data than such a discussion would have permitted. For the statistician, the book contains in the appendices many tables of norms, standard deviations, and other statistical symbols.

This book is not a text. It was written primarily as a contribution to a better understanding of how to measure reliably those human characteristics that have vocational significance and how to translate these human characteristics into vocational proficiency. However, if one is looking for an explanation of ways and means of interpreting this translated information to the counselee so that he can utilize it himself in making his own choices, (the heart of vocational counseling,) one will be disappointed. The authors do not state but apparently imply that if the vocational counselor knows what certain human characteristics mean in terms of occupational or job proficiency, he will be able to so interpret his information to the counselee that the latter will be able to use it in making his own choices in the solution of his vocational problems. But this omission does not necessarily detract from the great worthwhileness of the book. It could be read and studied with profit by the vocational counselor in general and those connected with federal and state employment service in particular. The book is quite readable, straightforward and to the point. It is a book that might well be in the personal library of anyone interested in vocational guidance or employment work.

G. E. BATHHURST
UNIVERSITY OF ALABAMA

INDEX

NAMES OF CONTRIBUTORS ARE PRINTED IN SMALL CAPITALS

Advertising by Direct Interviews, Evaluating the Effectiveness of, P. F. LAZARSFELD, 170

Aircraft Pilots, Selection and Training of, J. G. JENKINS, 228

ALLPORT, G. W., Psychological Service for Civilian Morale, 235

American Association for Applied Psychology, 1941, Edgar A. Doll, President of the, 47; Proceedings and Report of the Fourth Annual Conference, C. M. LOUTTIT, 14; Program of the Fifth Annual Conference of, 197

ANDERSON, J. E., portrait facing 253

Annual Conference, American Association for Applied Psychology, Summarized Proceedings and Report of the Fourth, C. M. LOUTTIT, 14; Program of the Fifth, 197

Applied Psychologists, Fundamentals and Fundamentalism in the Training of, H. B. ENGLISH, 1

Applied Psychology, II, Employment Trends in, F. H. FINCH and M. E. ODOROFF, 275

BAXTER B. and PATERSON, D. G., A New Ratio for Clinical Counselors, 123

BENNETT, G. K., The Museum Technique Applied to Market Research, 183

BIDDLE, W. W., Personality and Problems of Adjustment, by K. Young, 292

BINGHAM, W. V., Psychological Services in the United States Army, 221

Book Reviews: Biographies of Child Development, by A. L. Gesell, C. S. Amatruda, B. M. Castner, and H. Thompson, E. E. LORD, 90; Children from Seed to Saplings, by M. M. Reynolds, F. M. TEAGARDEN, 141; Dictionary of Terms and Expressions of Industrial Psychology, by M. Erdélyi and F. Grossman, B. V. MOORE, 91; Introduction to High School Counseling, by E. G. Williamson and M. E. Hahn, A. C. EURICH, 293; Matching Youth and Jobs, by H. M. Bell, M. R. TRABUE, 292; Principles of Abnormal Psychology, by A. H. Maslow and B. Mittelmann, L. F. SHAFFER, 251; The Psychodynamics of Abnormal Behavior, by J. F. Brown, D. SHAKOW, 140; Studies in Topological and Vector Psychology I, by K. Lewin, R. Lippitt, and S. K. Escalona, W. REICHENBERG, 294; Personality and Problems of Adjustment, by K. Young, W. W. BIDDLE, 292

BRITT, S. H., Pending Developments in the Legal Status of Psychologists, 52; Résumé of Washington Round Table on Certification of Psychologists, 74; The Listing of Personnel in Psychology, 243

Brotemarkle, R. A., Training Needed by Psychologists for Government Service, 245

Bryan, A. I. and Wilke, W. H., A Technique for Rating Public Speeches, 80

BURTT, H. E., Current Trends in Marketing Research, 145; portrait facing 145

CARMICHAEL, L., Psychological Aspects of the National Roster of Scientific and Specialized Personnel, 253

Caveat Emptor, M. S. VITELES, 117

Certification, Training as a Basis of, L. S. SELLING, 66

Certification and Licensing, Symposium on, 49

Certification by States or by Organizations, C. LANDIS, 56

Certification of Psychologists, Résumé of Washington Round Table on, S. H. BRITT, 74

Certification of Specialized Groups, E. L. CORNELL, 62

Certification to Unified Professional Status, Introduction: Contribution of, D. FRYER, 49

Characteristics of the Question as Determinants of Dependability, J. G. JENKINS, 164

Civil Service, Standards for Psychologists in, L. J. O'ROURKE, 59

Clinical Counselors, A New Ratio for, B. BAXTER and D. G. PATERSON, 123

Clinical Psychology, Retrogressive Trends in, F. KUHLMANN, 97

Committee in Psychology, The Emergency, K. M. DALLENBACH, 42; The Work of the Emergency, K. M. DALLENBACH, 210

Committee on Psychological Examination of Recruits, 1917, portrait facing 1

Comparison of the Diagnoses of a Graphologist with the Results of Psychological Tests, A, D. E. Super, 127

Coordination of Psychological Services in the

National Emergency, W. R. MILES, 216
CORNELL, E. L., Certification of Specialized Groups, 62
Counselors, A New Ratio for Clinical, B. BAXTER and D. G. PATERSON, 123
Current Trends in Marketing Research, H. E. BURTT, 145

DALLENBACH, K. M., The Emergency Committee in Psychology, 42; The Work of the Emergency Committee in Psychology, 210
DAVIS, F. B., The Derivation of Three Subscores from the 1937 Revision of the Stanford-Binet Scales, 287
Derivation of Three Subscores from the 1937 Revision of the Stanford-Binet Scales, The, F. B. DAVIS, 287
Doll, Edgar A., President of the American Association for Applied Psychology, 1941, 47
DUNLAP, J. W. and PETERSON, B. M., A Simplified Method for Scoring the Strong Vocational Interest Blank, 269

Educational Psychologists, New Fields for, A. I. GATES, 111
Educational Psychology—Individual or Social, W. C. TROW, 265
Effects of Repeated Interviewing on the Respondent's Answers, F. D. RUCH, 179
Employment Trends in Applied Psychology, II, F. H. FINCH and M. E. ODOROFF, 275
ENGLISH, H. B., Fundamentals and Fundamentalism in the Training of Applied Psychologists, 1
EURICH, A. C., Introduction to High School Counseling by E. G. Williamson and M. E. Hahn, 293
Evaluating the Effectiveness of Advertising by Direct Interviews, P. F. LAZARSFELD, 170

FINCH, F. H. and ODOROFF, M.E., Employment Trends in Applied Psychology, II, 275
FORUM, 95, 143, 252
FRYER, D., Introduction: Contribution of Certification to Unified Professional Status, 49
Fundamentals and Fundamentalism in the Training of Applied Psychologists, H. B. ENGLISH, 1

GATES, A. I., New Fields for Educational Psychologists, 111
Guidance, Psychological Practice and Research in Vocational, M. S. VITELES, 258

Effects of Repeated, F. D. RUCH, 179
Interviewing on the Respondent's Answers,
Issues in the Enactment of Legislation, M. A. SAFFIR, 70

JENKINS, J. G., Characteristics of the Question as Determinants of Dependability, 164; Selection and Training of Aircraft Pilots, 228

KORNHAUSER, A. W., The Role of Psychological Interpretation, 187
KUHLMANN, F., Retrogressive Trends in Clinical Psychology, 97
KUHLMANN, F., Types of Total Scores on Mental Tests, 279

LANDIS, C., Certification by States or by Organizations, 56
LAZARSFELD, P. F., Evaluating the Effectiveness of Advertising by Direct Interviews, 170
Legal Status of Psychologists, Pending Developments in the, S. H. BRITT, 52
Legislation, Issues in the Enactment of, M. A. SAFFIR, 70
Licensing, Symposium on Certification and, 49
Licensing of Psychologists, Résumé of Pennsylvania Round Table on, B. M. LUCKEY, 78
Listing of Personnel in Psychology, The, S. H. BRITT, 243
LORD, E. E., Biographies of Child Development, by A. L. Gesell, C. S. Amatruda, B. M. Castner, and H. Thompson, 90
LOUTTIT, C. M., Psychological Work in the United States Navy, 225; Summarized Proceedings and Report of the Fourth Annual Conference, American Association for Applied Psychology, 14
LUCKEY, B.M., Résumé of Pennsylvania Round Table on Licensing of Psychologists, 78

Man-Power and Military Effectiveness: The Case for Human Engineering, R. M. YERKES, 205
Market Problems and Market Research, Symposium on, 145
Market Research, Problems of Sampling in, F. STANTON, 154; The Museum Technique Applied to, G. K. BENNETT, 183
Marketing Research, Current Trends in, H. E. BURTT, 145
Mental Tests, Types of Total Scores on, F. KUHLMANN, 279
MILES, W. R., Coordination of Psychological Services in the National Emergency, 216
MOORE, B. V., Dictionary of Terms and Ex-
Erdélyi and F. Grossman, 91
pressions of Industrial Psychology, by M.

Morale, Psychological Service for Civilian, G. W. ALLPORT, 235
Museum Technique Applied to Market Research, The, G. K. BENNETT, 183

National Roster of Scientific and Specialized Personnel, Psychological Aspects of the, L. CARMICHAEL, 253
New Fields for Educational Psychologists, A.I. GATES, 111
New Ratio for Clinical Counselors, A, B. BAXTER and D. G. PATERSON, 123
News Notes, 44, 92, 138, 190, 249

ODOROFF, M. E. and FINCH, F. H., Employment Trends in Applied Psychology, II, 275
Official Association Reports, 14, 42, 134
O'ROURKE, L. J., Standards for Psychologists in Civil Service, 59
OTIS, A. S., portrait facing 205

PATERSON, D. G. and BAXTER, B., A New Ratio for Clinical Counselors, 123
Personnel, Psychological Aspects of the National Roster of Scientific and Specialized, L. CARMICHAEL, 253
Personnel in Psychology, The Listing of, S. H. BRITT, 243
PETERSON, B. M. and DUNLAP, J. W., A Simplified Method for Scoring the Strong Vocational Interest Blank, 269
Portraits: J. E. Anderson, facing 253; H. E. Burtt, facing 145; Committee on Psychological Examination of Recruits, 1917, facing 1; A. S. Otis, facing 205; C. Spearman, facing 97; M. S. Viteles, facing 49
Problems of Sampling in Market Research, F. STANTON, 154
Proceedings and Report of the Fourth Annual Conference, American Association for Applied Psychology, C. M. LOUTTIT, 14
Professional Status, Introduction: Contribution of Certification to Unified, D. FRYER, 49
Program of the Fifth Annual Conference of American Association for Applied Psychology, 197
Proving Ground on Public Opinion, H. G. WEAVER, 149
Psychological Aspects of the National Roster of Scientific and Specialized Personnel, L. CARMICHAEL, 253
Psychological Interpretation, The Role of, A. W. KORNHAUSER, 187
Psychological Practice and Research in Vocational Guidance, M. S. VITELES, 258
Psychological Service for Civilian Morale, G. W. ALLPORT, 235
Psychological Service in National Defense, Symposium on, 205
Psychological Services in the National Emergency, Coordination of, W. R. MILES, 216
Psychological Tests, A Comparison of the Diagnoses of a Graphologist with the Results of, D. E. SUPER, 127
Psychological Work in the United States Navy, C. M. LOUTTIT, 225
Psychologists, Fundamentals and Fundamentalism in the Training of Applied, H. B. ENGLISH, 1; New Fields for Educational A. I. GATES, 111; Pending Developments in the Legal Status of, S. H. BRITT, 52; Résumé of Pennsylvania Round Table on Licensing of, B. M. LUCKEY, 78; Résumé of Washington Round Table on Certification of, S. H. BRITT, 74
Psychologists' Activities in the National Emergency, D. WOLFLE, 240
Psychologists for Government Service, Training Needed by, R. A. BROTEMARKLE, 245
Psychologists in Civil Service, Standards for, L. J. O'ROURKE, 59
Psychology, Retrogressive Trends in Clinical, F. KUHLMANN, 97; The Emergency Committee in, K. M. DALLENBACH, 42; The Listing of Personnel in, S. H. BRITT, 243; The Work of the Emergency Committee in, K. M. DALLENBACH, 210
Psychology—Individual or Social, Educational, W. C. TROW, 265
Public Speeches, A Technique for Rating, A. I. BRYAN and W. H. WILKE, 80
Publications Received, 142

REICHENBERG, W., Studies in Topological and Vector Psychology I, by K. Lewin, R. Lippitt, and S. K. Escalona, 294
Report of the Fourth Annual Conference, American Association for Applied Psychology, Summarized Proceedings and, C. M. LOUTTIT, 14
Research, Current Trends in Marketing, H. E. BURTT, 145; Problems of Sampling in Market, F. STANTON, 154; The Museum Technique Applied to Market, G. K. BENNETT, 183
Research in Vocational Guidance, Psychological Practice and, M. S. VITELES, 258
Résumé of Pennsylvania Round Table on Licensing of Psychologists, B. M. LUCKEY, 78
Résumé of Washington Round Table on Certification of Psychologists, S. H. BRITT, 74
Retrogressive Trends in Clinical Psychology, F. KUHLMANN, 97

Role of Psychological Interpretation, The, A. W. KORNHAUSER, 187
RUCH, F. D., Effects of Repeated Interviewing on the Respondent's Answers, 179

SAFFIR, M. A., Issues in the Enactment of Legislation, 70
Sampling in Market Research, Problems of, F. STANTON, 154
Selection and Training of Aircraft Pilots, J. G. JENKINS, 228
SELLING, L. S., Training as a Basis of Certification, 66
SHAFFER, L. F., Principles of Abnormal Psychology, by A. H. Maslow and B. Mittelmann, 251
SHAKOW, D., The Psychodynamics of Abnormal Behavior, by J. F. Brown, 141
Simplified Method for Scoring the Strong Vocational Interest Blank, A, B. M. PETERSON, and J. W. DUNLAP, 269
Some Functions of Mental Measurement in the Young Superior Adult, F. L. WELLS, 105
SPEARMAN, C., portrait facing 97
Standards for Psychologists in Civil Service, L. J. O'ROURKE, 59
Stanford-Binet Scales, The Derivation of Three Subscores from the 1937 Revision of the, F. B. DAVIS, 287
STANTON, F., Problems of Sampling in Market Research, 154
Summarized Proceedings and Report of the Fourth Annual Conference, American Association for Applied Psychology, C. M. LOUTTIT, 14
SUPER, D. E., A Comparison of the Diagnoses of a Graphologist with the Results of Psychological Tests, 127
Symposium on Certification and Licensing, 49
Symposium on Market Problems and Market Research, 145
Symposium on Psychological Service in National Defense, 205

TEAGARDEN, F. M., Children from Seed to Saplings, by M. M. Reynolds, 141
Technique for Rating Public Speeches, A, A. I. BRYAN and W. H. WILKE, 80
TRABUE, M. R., Matching Youth and Jobs, by H. M. Bell, 292
Training as a Basis of Certification, L. S. SELLING, 66
Training Needed by Psychologists for Government Service, R. A. BROTEMARKLE, 245
Training of Aircraft Pilots, Selection and, J. G. JENKINS, 228
Training of Applied Psychologists, Fundamentals and Fundamentalism in the , H. B. ENGLISH, 1
TROW, W. C., Educational Psychology — Individual or Social, 265
Types of Total Scores on Mental Tests, F. KUHLMANN, 279

VITELES, M. S., Caveat Emptor, 117; portrait facing 49; Psychological Practice and Research in Vocational Guidance, 258

WEAVER, H. G., Proving Ground on Public Opinion, 149
WELLS, F. L., Some Functions of Mental Measurement in the Young Superior Adult, 105
WILKE, W. H. and BRYAN, A. I., A Technique for Rating Public Speeches, 80
WOLFLE, D., Psychologists' Activities in the National Emergency, 240
Work of the Emergency Committee in Psychology, The, K. M. DALLENBACH, 210

YERKES, R. M., Man-Power and Military Effectiveness: The Case for Human Engineering, 205

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